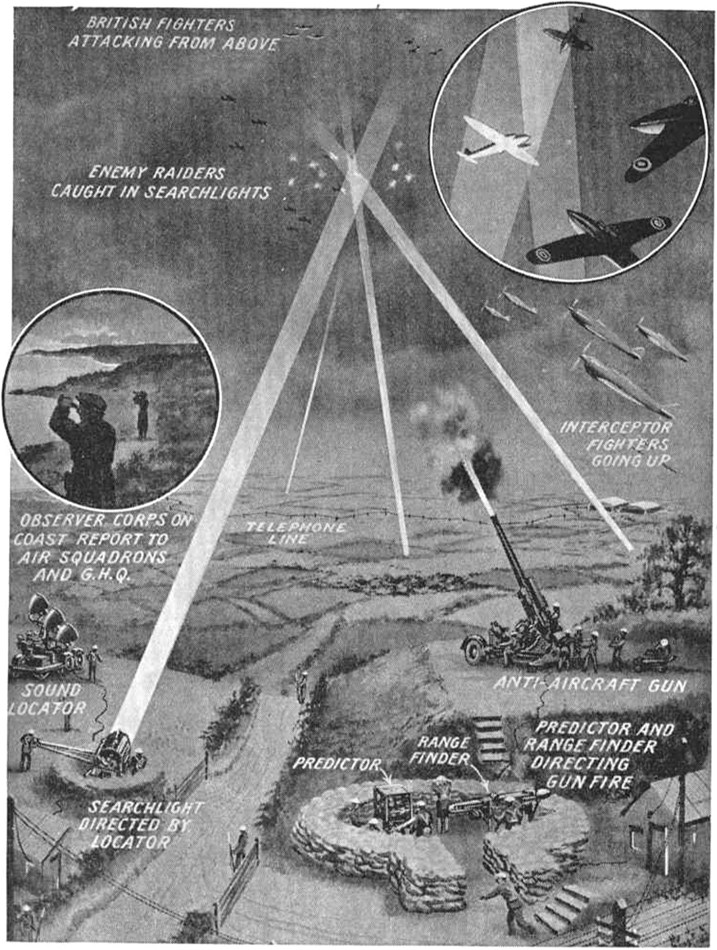
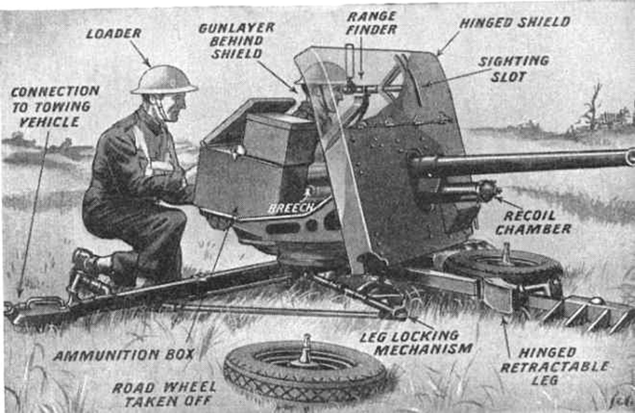
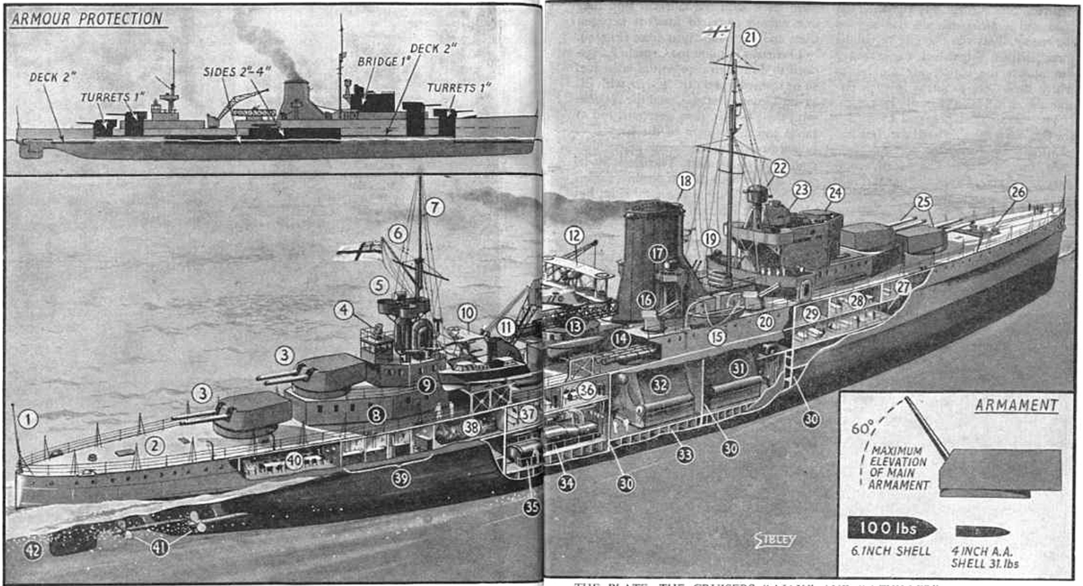


BRITISH FIGHTERS ATTACKING FROM ABOVE
ENEMY RAIDERS CAUGHT IN SEARCHLIGHTS
INTERCEPTOR FIGHTERS GOING UP
OBSERVER CORPS ON COAST REPORT TO AIR SQUADRONS AND G.H.Q.
TELEPHONE LINE
SOUND LOCATOR
ANTI-AIRCRAFT GUN
PREDICTOR AND RANGE FINDER DIRECTING GUN FIRE
RANGE FINDER
PREDICTOR
SEARCHLIGHT DIRECTED BY LOCATOR

HOW THE HOME DEFENCE SYSTEM WORKS

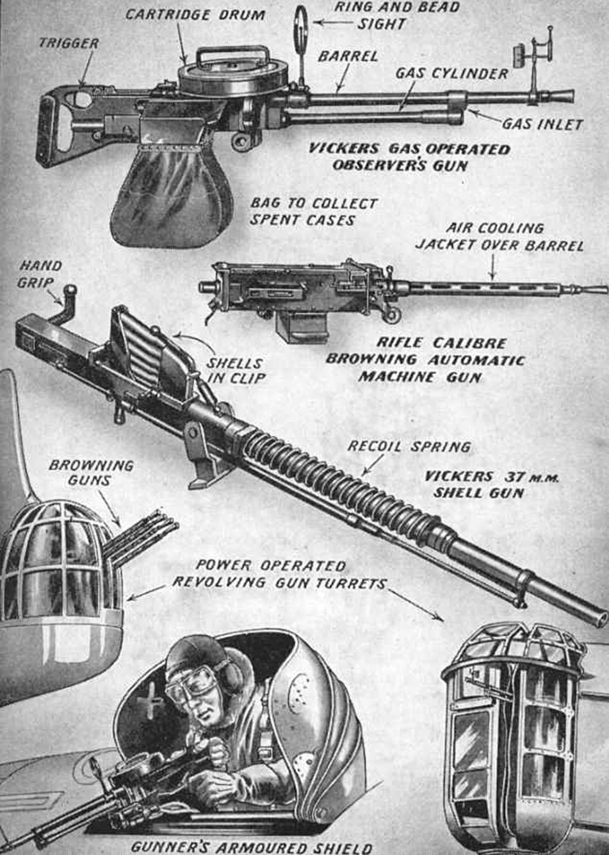
An artist's impression of the co-ordination of units of the Home Defence Forces. In actual practice they are not grouped so closely together. Observer Corps report to Central Control Headquarters, giving information of the approach of enemy aircraft. Headquarters telephone appropriate searchlight and anti-aircraft batteries and fighter plane stations. Sound locators automatically train searchlights on the raiders, and predictors and range finders direct gunfire. Fire ceases as intercepter fighters swoop into attack.

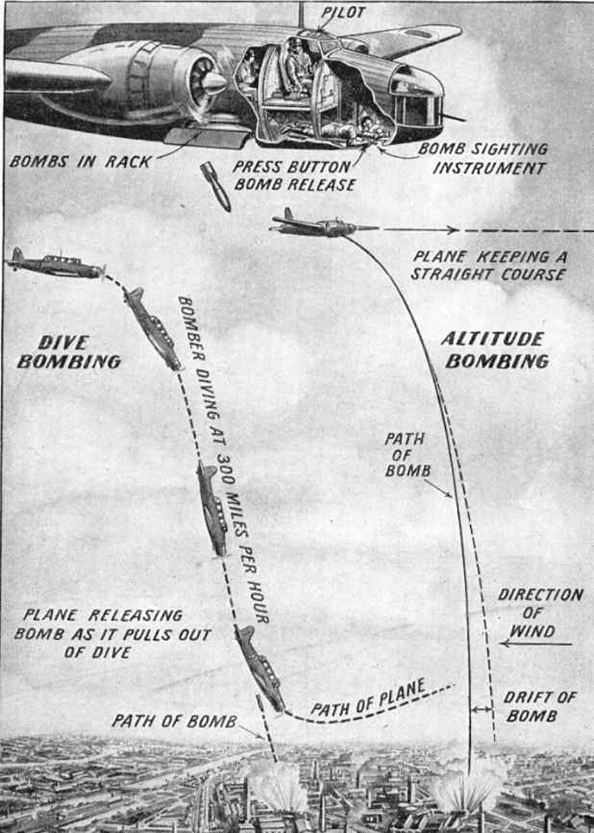

LOADER
GUNLAYER BEHIND SHIELD
RANGE FINDER
HINGED SHIELD
SIGHTING SLOT
CONNECTION TO TOWING VEHICLE
BREECH
RECOIL CHAMBER
LEG LOCKING MECHANISM
AMMUNITION BOX
HINGED RETRACTABLE LEG
ROAD WHEEL TAKEN OFF

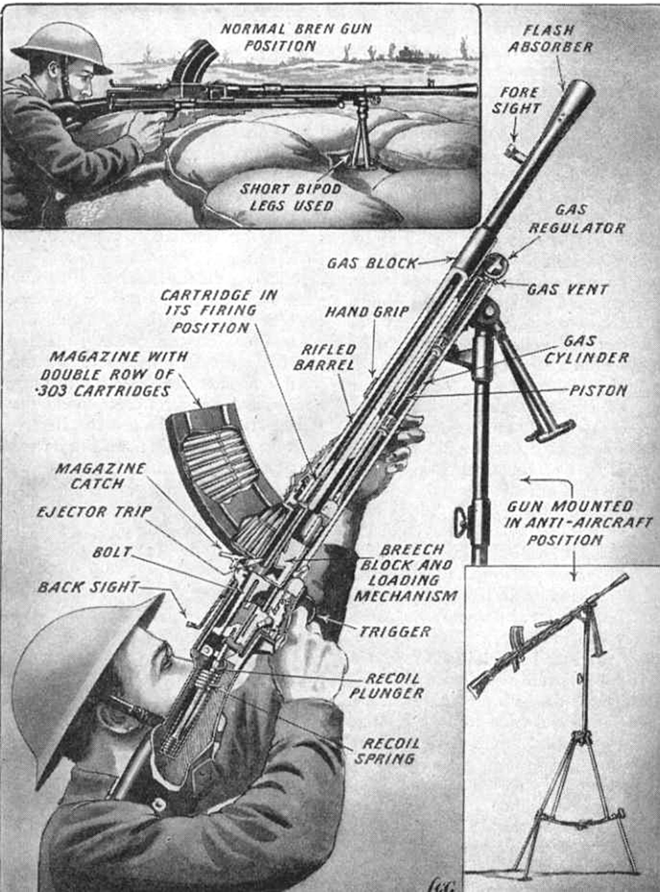


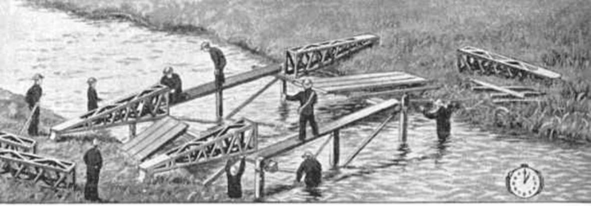
SOME DETAILS OF THE VICTORS OF THE BATTLE OF

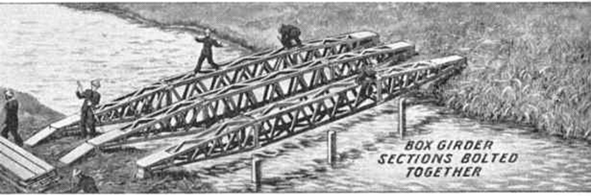
THE PLATE, THE CRUISERS "AJAX" AND "ACHILLES"

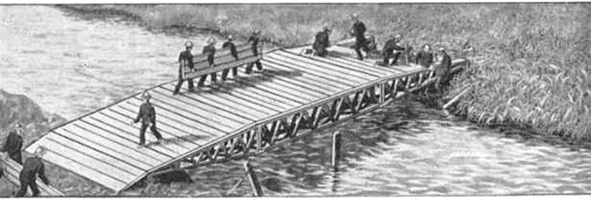

CARTRIDGE DRUM
RING AND BEAD SIGHT
TRIGGER
BARREL
GAS CYLINDER
GAS INLET
VICKERS GAS OPERATED OBSERVER'S GUN
BAG TO COLLECT SPENT CASES
AIR COOLING JACKET OVER BARREL
HAND GRIP
RIFLE CALIBRE BROWNING AUTOMATIC MACHINE GUN
SHELLS IN CLIP
RECOIL SPRING
VICKERS 37 M.M. SHELL GUN
BROWNING GUNS
POWER OPERATED REVOLVING GUN TURRETS
GUNNER'S ARMOURED SHIELD

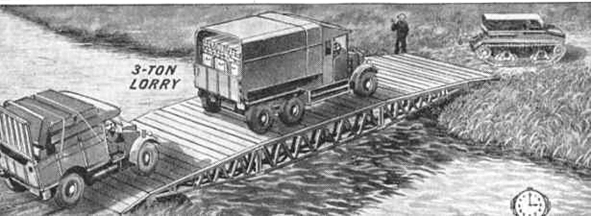

PILOT
BOMBS IN RACK
PRESS BUTTON BOMB RELEASE
BOMB SIGHTING INSTRUMENT
PLANE KEEPING A STRAIGHT COURSE
DIVE BOMBING
BOMBER DIVING AT 300 MILES PER HOUR
ALTITUDE BOMBING
PATH OF BOMB
PLANE RELEASING BOMB AS IT PULLS OUT OF DIVE
DIRECTION OF WIND
PATH OF PLANE
DRIFT OF BOMB
PATH OF BOMB

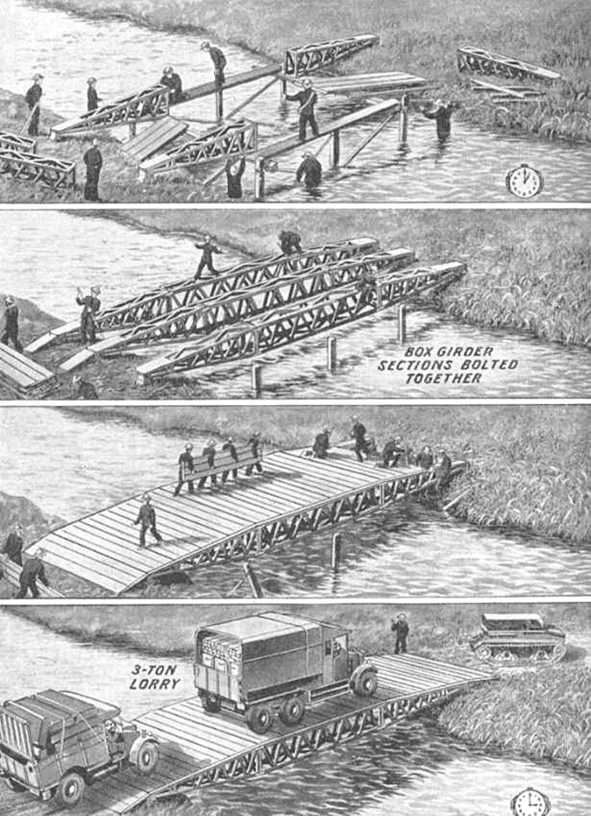

NORMAL BREN GUN POSITION
SHORT BIPOD LEGS USED
FLASH ABSORBER
FORE SIGHT
GAS REGULATOR
GAS BLOCK
GAS VENT
CARTRIDGE IN ITS FIRING POSITION
HAND GRIP
RIFLED BARREL
GAS CYLINDER
PISTON
MAGAZINE WITH DOUBLE ROW OF ·303 CARTRIDGES
MAGAZINE CATCH
EJECTOR TRIP
BOLT
BACK SIGHT
BREECH BLOCK AND LOADING MECHANISM
TRIGGER
RECOIL PLUNGER
RECOIL SPRING
GUN MOUNTED IN ANTI-AIRCRAFT POSITION

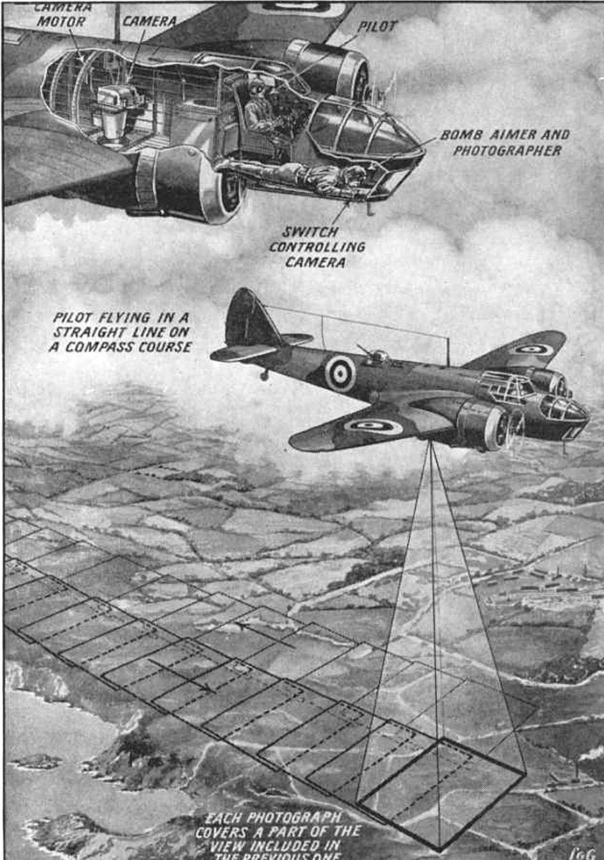


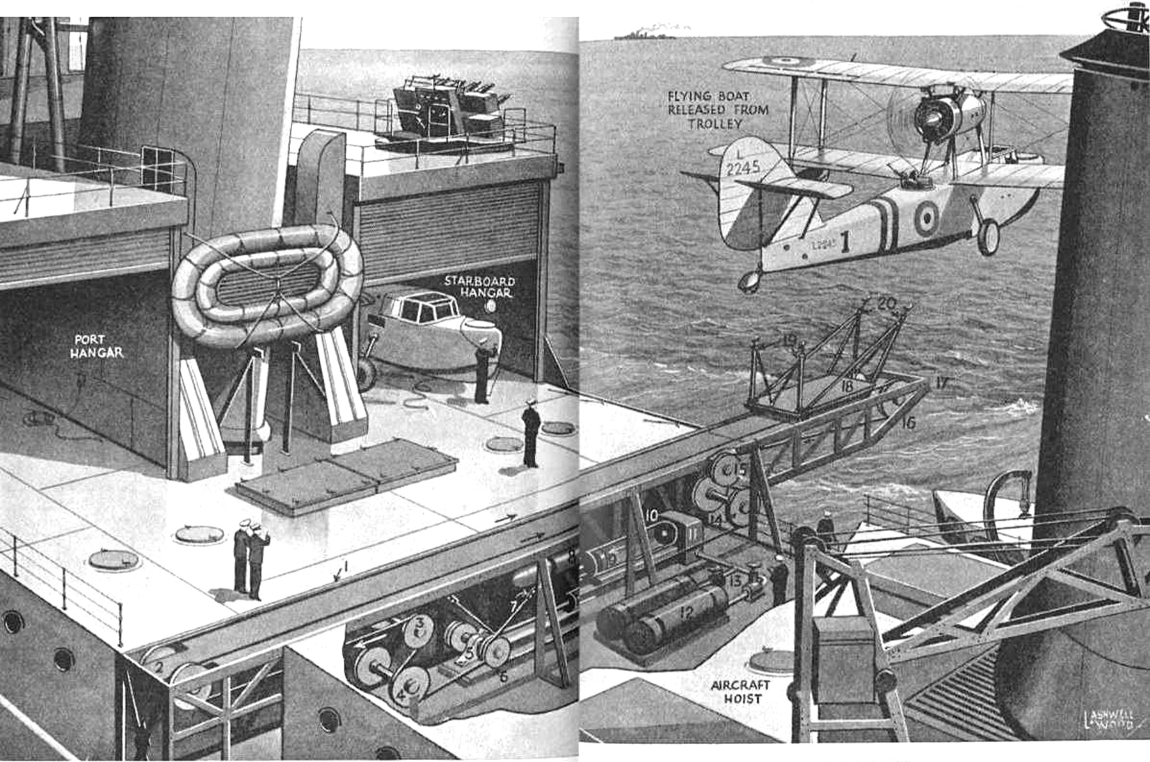

BOX GIRDER SECTIONS BOLTED TOGETHER




3-TON LORRY

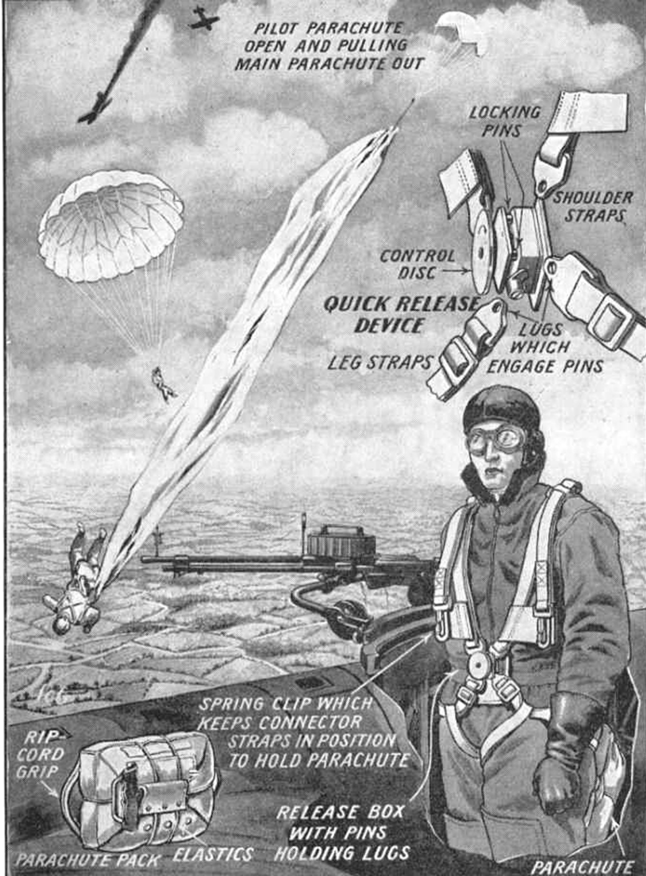

BOX GIRDER SECTIONS BOLTED TOGETHER
3-TON LORRY

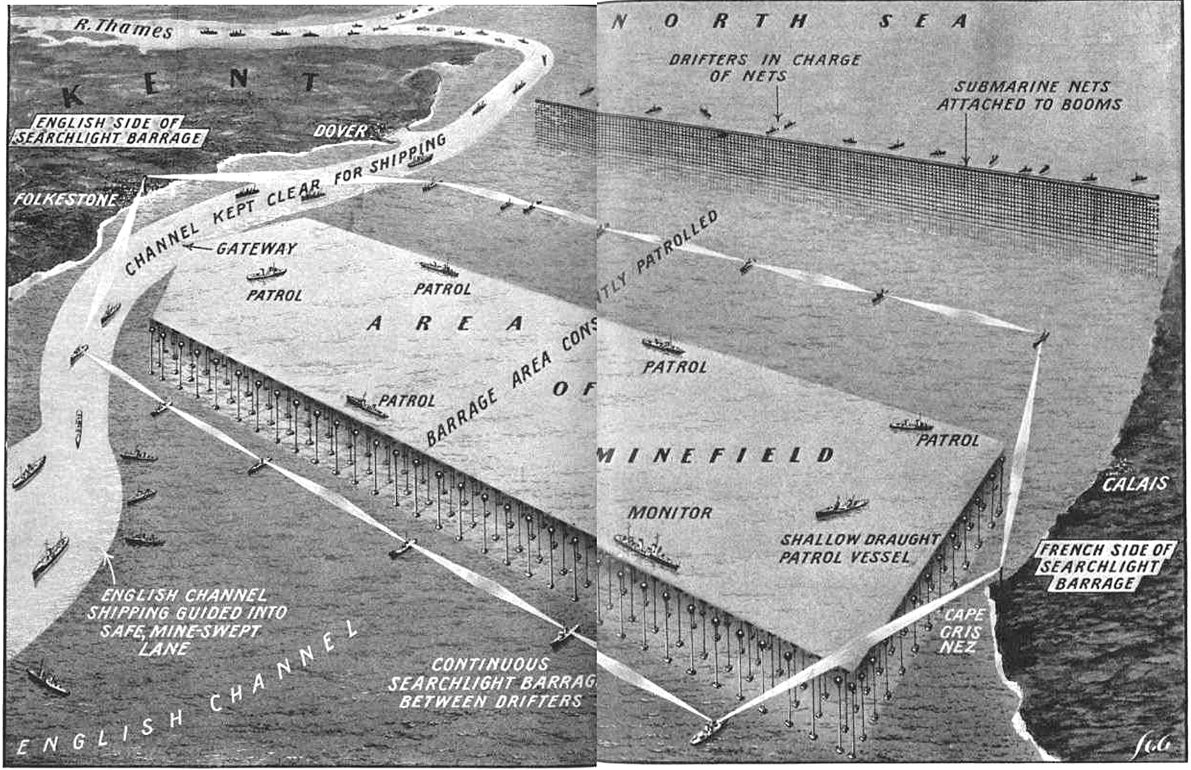

CAMERA MOTOR
CAMERA
PILOT
BOMB AIMER AND PHOTOGRAPHER
SWITCH CONTROLLING CAMERA
PILOT FLYING IN A STRAIGHT LINE ON A COMPASS COURSE
EACH PHOTOGRAPH COVERS A PART OF THE VIEW INCLUDED IN THE PREVIOUS ONE



HOW A MODERN NAVAL FLYING BOAT IS CATAPULTED FROM A BRITISH CRUISER

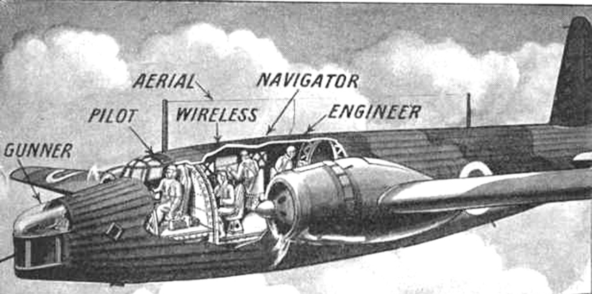
Fig. 8. *The flying boat illustrated is being launched from a cruiser of the "Southampton" class. 1, Catapult trolley rails. 2, 3, 4, Series of retarding pulleys and cables. 5, Sliding crosshead carrying accelerating pulleys, 6, and cables. 7, Cable anchorage to frame. 8, Glycerine chamber for cushion effect on piston. 9, 10, 11, 12, 13, Compressed-air cylinder, valve chamber reservoirs and control valves. 14, 15, 16, Series of accelerating pulleys and cables. 17, Retractable extension over ship's side. 18, Trolley. 19, After release hooks. 20, Forward release hooks.*

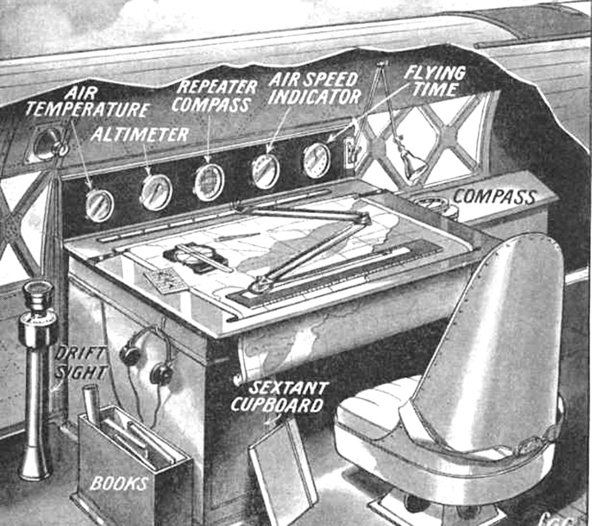

PILOT PARACHUTE OPEN AND PULLING MAIN PARACHUTE OUT
LOCKING PINS
SHOULDER STRAPS
CONTROL DISC
QUICK RELEASE DEVICE
LUGS WHICH ENGAGE PINS
LEG STRAPS
SPRING CLIP WHICH KEEPS CONNECTOR STRAPS IN POSITION TO HOLD PARACHUTE
RIP-CORD GRIP
PARACHUTE PACK
ELASTICS
RELEASE BOX WITH PINS HOLDING LUGS
PARACHUTE


R. Thames
KENT
ENGLISH SIDE OF SEARCHLIGHT BARRAGE
DOVER
FOLKESTONE
CHANNEL KEPT CLEAR FOR SHIPPING
GATEWAY
PATROL
PATROL
AREA OF
MINEFIELD
BARRAGE AREA CONS
TLY PATROLLED
PATROL
NORTH SEA
DRIFTERS IN CHARGE OF NETS
SUBMARINE NETS ATTACHED TO BOOMS
PATROL
PATROL
MONITOR
SHALLOW DRAUGHT PATROL VESSEL
CALAIS
FRENCH SIDE OF SEARCHLIGHT BARRAGE
CAPE GRIS NEZ
ENGLISH CHANNEL SHIPPING GUIDED INTO SAFE, MINE-SWEPT LANE
ENGLISH CHANNEL
CONTINUOUS SEARCHLIGHT BARRAG
BETWEEN DRIFTERS

HOW THE STRAITS OF DOVER ARE GUARDED IN WARTIME

Fig. 16. *Minefields, searchlight barrages, submarine nets and patrol vessels all combine to keep enemy raiders out of the Straits of Dover, as our artist's impression, based on the system used in the war of 1914-18, portrays. In wartime much of the English Channel is closed to ships, and a lane, patrolled and swept of mines, is maintained through the barrage area. Allied and neutral shipping is guided into this safe channel. Ships suspected of carrying contraband can be directed to a control port where they will be examined.*


AERIAL
NAVIGATOR
PILOT
WIRELESS
ENGINEER
GUNNER


AIR TEMPERATURE
REPEATER COMPASS
AIR SPEED INDICATOR
FLYING TIME
ALTIMETER
COMPASS
DRIFT SIGHT
SEXTANT CUPBOARD
BOOKS

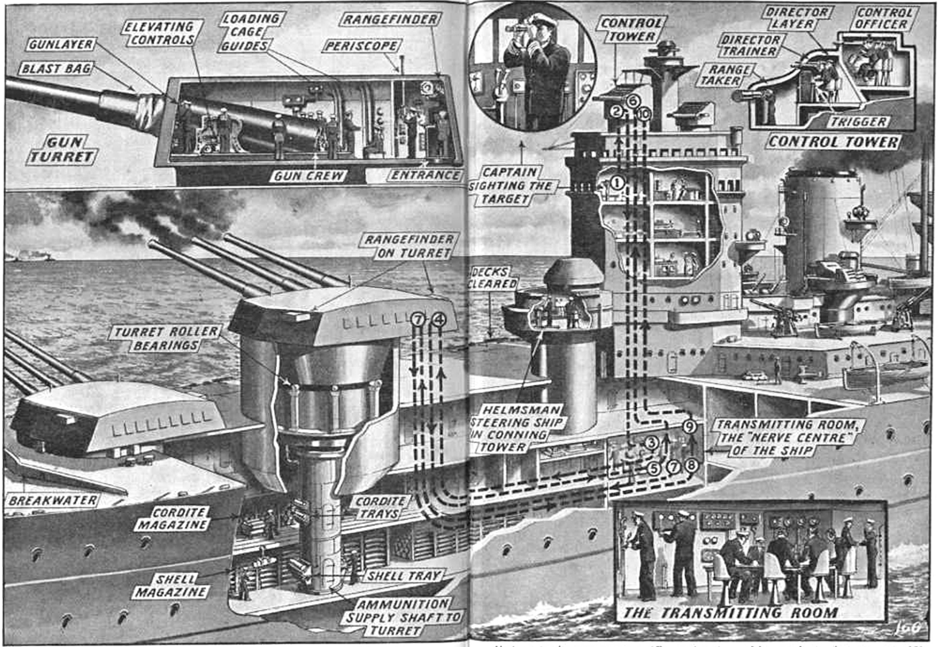
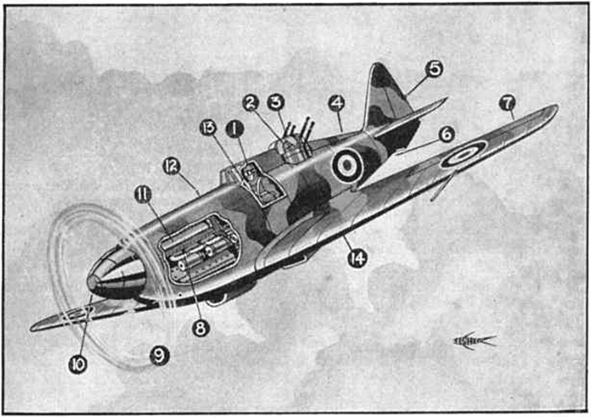
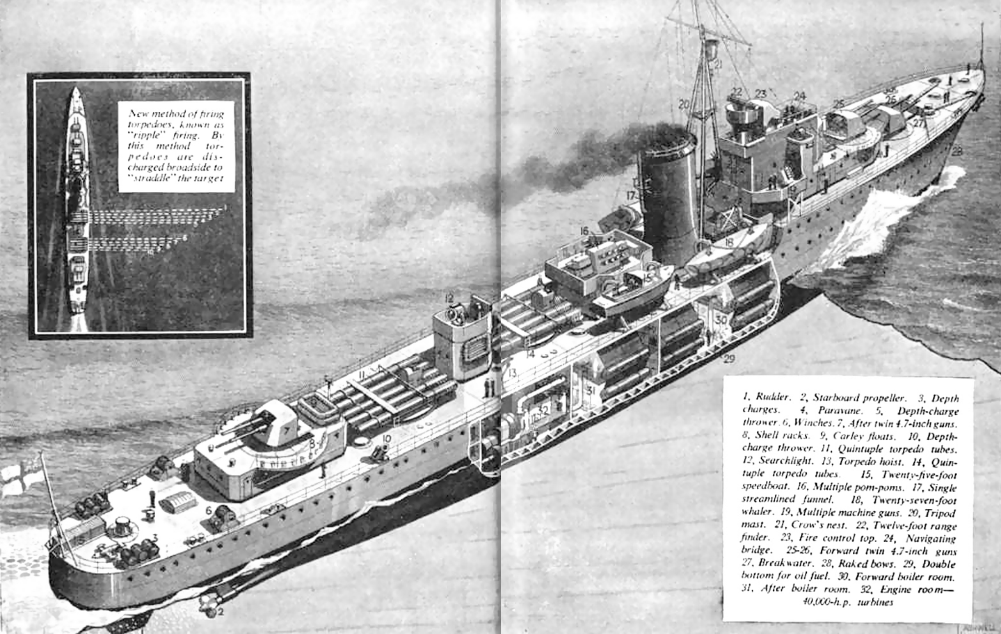


Fig. 18. *How the guns of a battleship are aimed and fired from a central control tower high up in the superstructure. (For explanation and key to the numbers, see page 260.)*



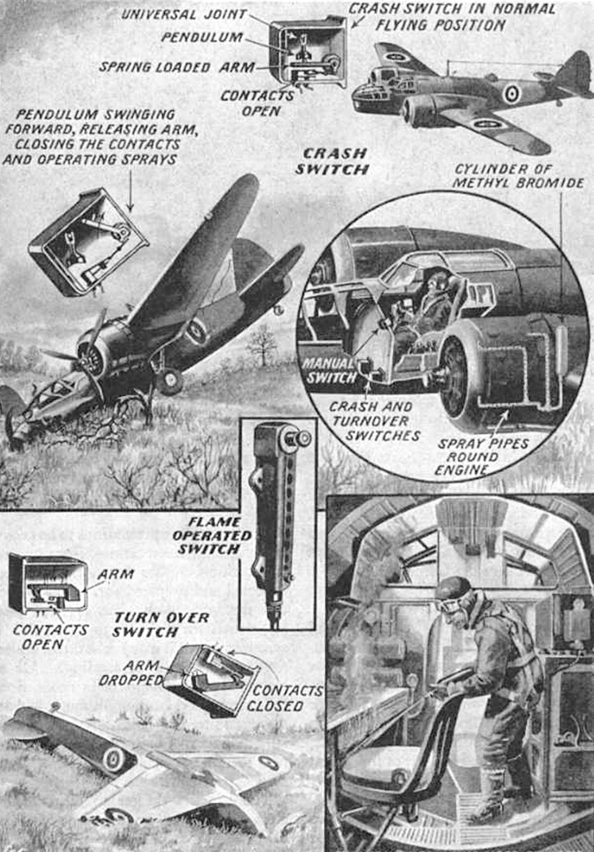
BOULTON PAUL "DEFIANT" TWO-SEATER FIGHTER

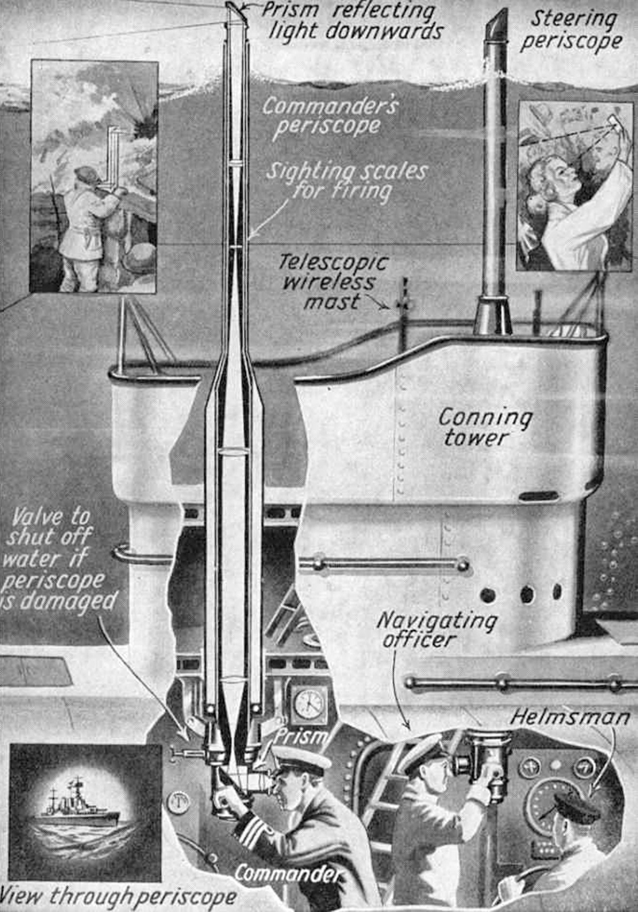
Fig. 6. *This powerfully-armed fighter is fitted with a mechanically-operated gun turret. 1, Pilot. 2, Gunner observer. 3, Mechanically operated multi-gun turret. 4, Stressed-skin fuselage. 5, Tail light. 6, Retracted tail wheel. 7, Aileron. 8, Exhausts. 9, Variable-pitch three-blade airscrew. 10, Spinner. 11, 1,030-h.p. Rolls-Royce "Merlin" engine (liquid cooled). 12, Front bead sight. 13, Instrument panel. 14, Inward retracted undercarriage.*

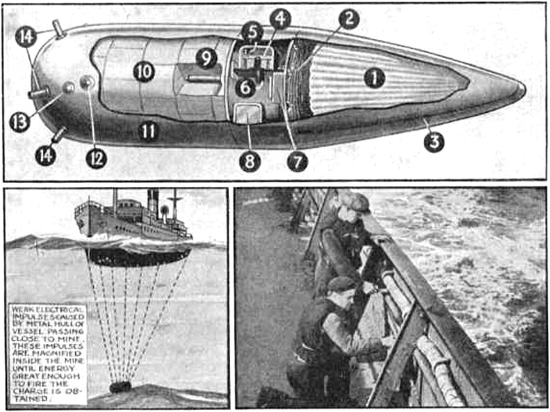


New method of firing torpedoes, known as "ripple" firing. By this method torpedoes are discharged broadside to "straddle" the target

1, Rudder. 2, Starboard propeller. 3, Depth charges. 4, Paravane. 5, Depth-charge thrower. 6, Winches. 7, After twin 4.7-inch guns. 8, Shell racks. 9, Carley floats. 10, Depth-charge thrower. 11, Quintuple torpedo tubes. 12, Searchlight. 13, Torpedo hoist. 14, Quintuple torpedo tubes. 15, Twenty-five-foot speedboat. 16, Multiple pom-poms. 17, Single streamlined funnel. 18, Twenty-seven-foot whaler. 19, Multiple machine guns. 20, Tripod mast. 21, Crow's nest. 22, Twelve-foot range finder. 23, Fire control top. 24, Navigating bridge. 25-26, Forward twin 4.7-inch guns 27, Breakwater. 28, Raked bows. 29, Double bottom for oil fuel. 30, Forward boiler room. 31, After boiler room. 32, Engine room—40,000-h.p. turbines

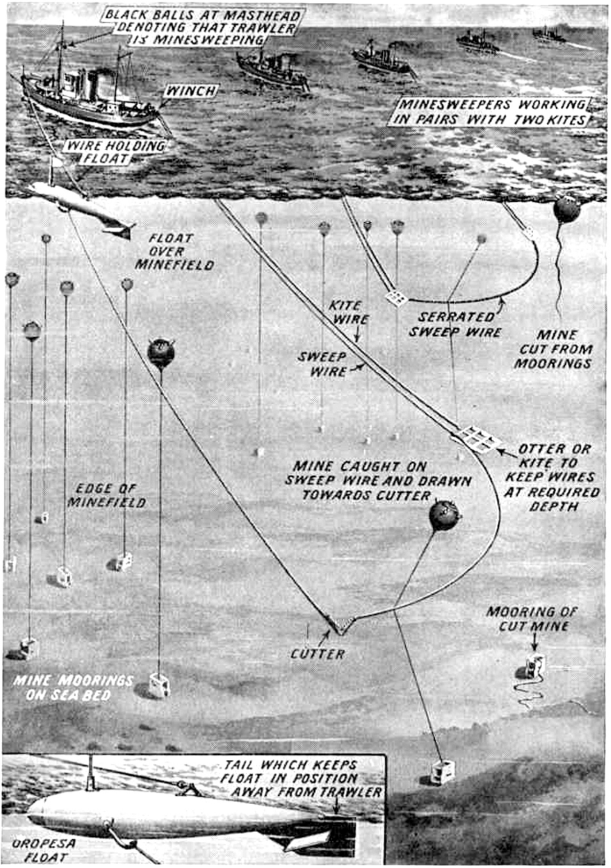

UNIVERSAL JOINT
PENDULUM
SPRING LOADED ARM
CONTACTS OPEN
CRASH SWITCH IN NORMAL FLYING POSITION
PENDULUM SWINGING FORWARD, RELEASING ARM, CLOSING THE CONTACTS AND OPERATING SPRAYS
CRASH SWITCH
CYLINDER OF METHYL BROMIDE
MANUAL SWITCH
CRASH AND TURNOVER SWITCHES
SPRAY PIPES ROUND ENGINE
FLAME OPERATED SWITCH
ARM
CONTACTS OPEN
TURN OVER SWITCH
ARM DROPPED
CONTACTS CLOSED


Prism reflecting light downwards
Steering periscope
Commander's periscope
Sighting scales for firing
Telescopic wireless mast
Conning tower
Valve to shut off water if periscope is damaged
Navigating officer
Helmsman
Prism
Commander
View through periscope


14
5
4
2
9
10
1
6
13
11
3
14
12
8
7
WEAK ELECTRICAL IMPULSES CAUSED BY METAL HULL OF VESSEL PASSING CLOSE TO MINE. THESE IMPULSES ARE MAGNIFIED INSIDE THE MINE UNTIL ENERGY GREAT ENOUGH TO FIRE THE CHARGE IS OBTAINED.

DETAILS OF THE GERMAN PARACHUTE MAGNETIC MINE

Fig. 14. *Top, section of magnetic mine. 1, Parachute. 2, Parachute ropes. 3, Parachute case. 4, Magnetic needle. 5, Contact. 6, Counter weight. 7, Relay. 8, Battery. 9, Detonator. 10, Explosive (650 lb.). 11, Metal case. 12, Impact detonator. 13, Hydrostatic valve. 14, Horns to prevent rolling. Lower left, what happens when a ship passes over a magnetic mine. Lower right, equipping a vessel with "de Gaussing" device (see text for details)*


BLACK BALLS AT MASTHEAD DENOTING THAT TRAWLER IS MINESWEEPING
WINCH
MINESWEEPERS WORKING IN PAIRS WITH TWO KITES
WIRE HOLDING FLOAT
FLOAT OVER MINEFIELD
KITE WIRE
SERRATED SWEEP WIRE
MINE CUT FROM MOORINGS
SWEEP WIRE
OTTER OR KITE TO KEEP WIRES AT REQUIRED DEPTH
MINE CAUGHT ON SWEEP WIRE AND DRAWN TOWARDS CUTTER
EDGE OF MINEFIELD
MOORING OF CUT MINE
CUTTER
MINE MOORINGS ON SEA BED
TAIL WHICH KEEPS FLOAT IN POSITION AWAY FROM TRAWLER
OROPESA FLOAT

HOW MINESWEEPERS KEEP THE SHIPPING LANES CLEAR

Fig. 15. *On the left a minesweeper is working alone. On the right are minesweepers working in pairs. The Oropesa float (inset, bottom) keeps the wire away from the trawlers.*

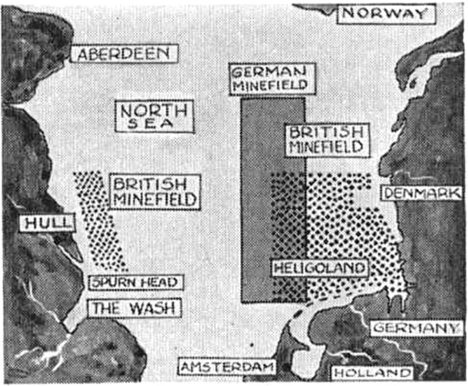
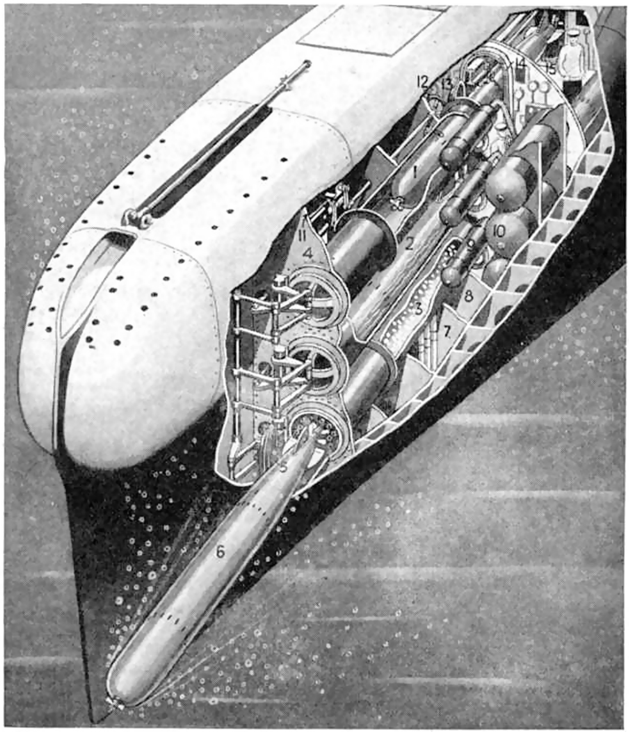
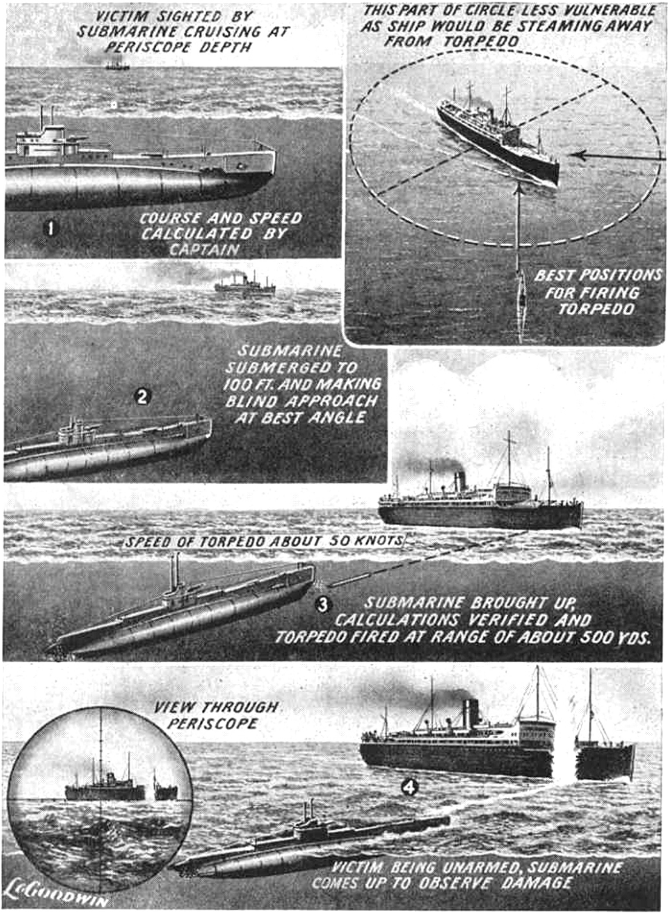


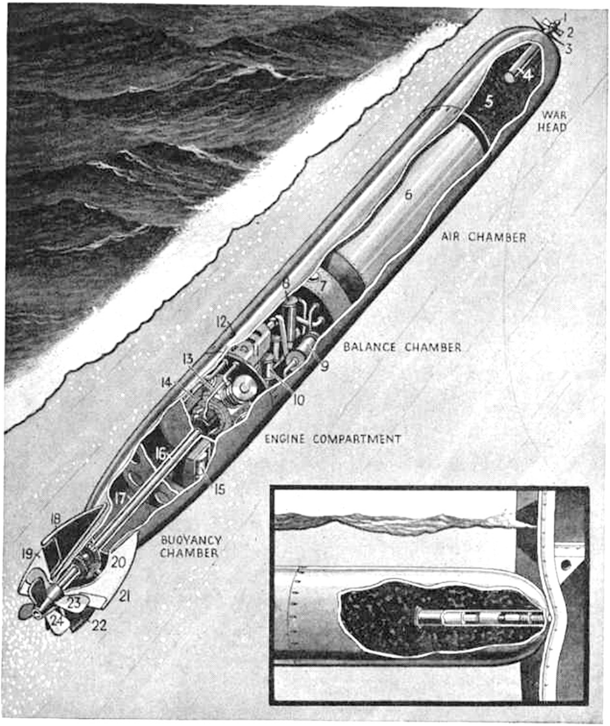
Fig. 11. *Distribution of British and German minefields in the North Sea in November, 1939. In wartime minefields are always being extended for strategic purposes.*



HOW A TORPEDO IS FIRED FROM A SUBMARINE

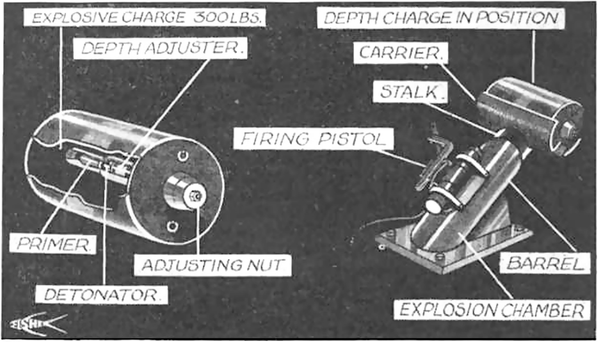
Fig. 9. *Here, in diagrammatic form, is shown the method of firing torpedoes from a submarine. The three principal operations are shown in the three port torpedo tubes of a modern British submarine. There are, of course, three other tubes on the starboard side. The torpedo is the most destructive weapon known today and a salvo of three would cost about £6,000. Each one is an extremely complicated and costly piece of mechanism. 1, Torpedo being loaded into tube, front cap closed, back open. 2, Both caps closed and tube being flooded to outside sea pressure. 3, Front cap opened and torpedo being fired by compressed air; after firing the front cap is closed and the tube pumped dry ready to load again. 4, Front tube caps. 5, Front tube cap open. 6, Torpedo leaving tube. 7, Draining and flooding tank. 8, Forward trimming tank. 9, Compressed air firing cylinder. 10, Compressed air storage. 11, Telemotor for operating tube caps. 12, Tube cap operating wheel. 13, Rear cap open. 14, Watertight door to shut off the compartment. 15, Torpedo handling and storage compartment.*


VICTIM SIGHTED BY SUBMARINE CRUISING AT PERISCOPE DEPTH
1
COURSE AND SPEED CALCULATED BY CAPTAIN
THIS PART OF CIRCLE LESS VULNERABLE AS SHIP WOULD BE STEAMING AWAY FROM TORPEDO
BEST POSITIONS FOR FIRING TORPEDO
2
SUBMARINE SUBMERGED TO 100 FT. AND MAKING BLIND APPROACH AT BEST ANGLE
SPEED OF TORPEDO ABOUT 50 KNOTS
3
SUBMARINE BROUGHT UP, CALCULATIONS VERIFIED AND TORPEDO FIRED AT RANGE OF ABOUT 500 YDS.
VIEW THROUGH PERISCOPE
4
VICTIM BEING UNARMED, SUBMARINE COMES UP TO OBSERVE DAMAGE
LeGOODWIN



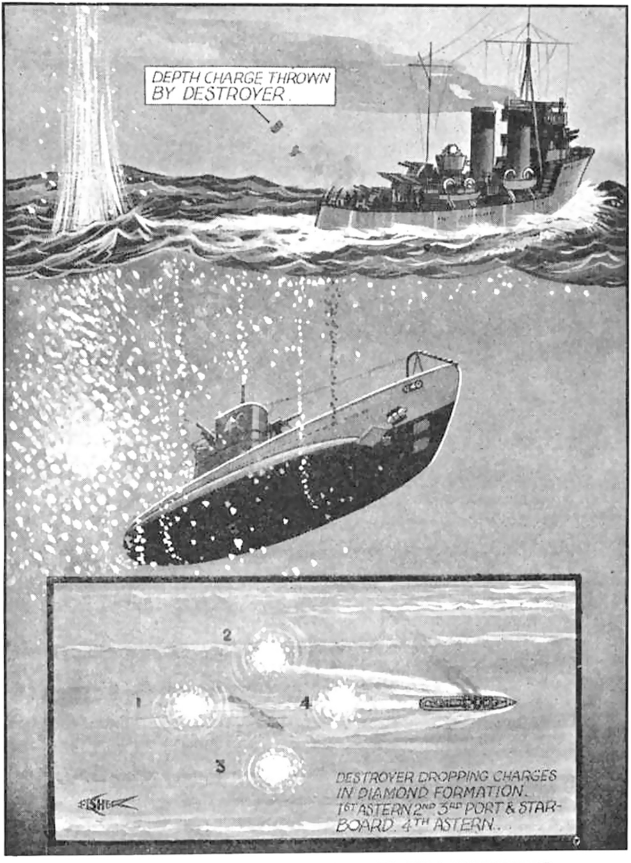
CONSTRUCTION OF THE MODERN TORPEDO

Fig. 13. *A 21-inch torpedo costs £2,000 and has 6,000 separate parts. It is probably the most lethal weapon in existence. 1, Firing pin. 2, Safety screw. 3, Whisker. 4, Detonator. 5, 500-lb. high explosive. 6, Compressed-air chamber. 7, Water chamber. 8, Hydrostatic depth control gear. 9, Steering control for horizontal rudders. 10, Paraffin bottle. 11, Trip valves and starting gear. 12, Trigger starter. 13, Four-cylinder hot-air driven radial engine of 350 h.p. 14, Servo motor. 15, Gyroscopic rudder control. 16, Propeller shaft, and 17, tunnel. 18, Upper vertical fin and rudder. 19, Port horizontal fin and rudder. 20, Gearbox driving propellers in opposite directions. 21, Starboard horizontal fin and rudder. 22, Lower vertical fin and rudder. 23, Forward propeller. 24, After propeller. Inset shows torpedo at moment of contact. The safety screw has worked off during the torpedo's passage through the water, and the firing pin which operates the detonator is driven home by the impact.*



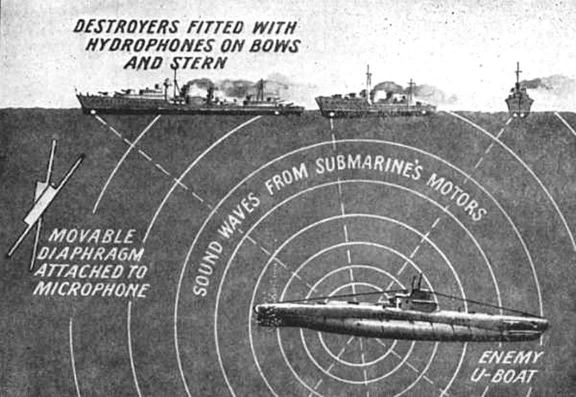
CONSTRUCTION AND FIRING MECHANISM OF DEPTH CHARGE

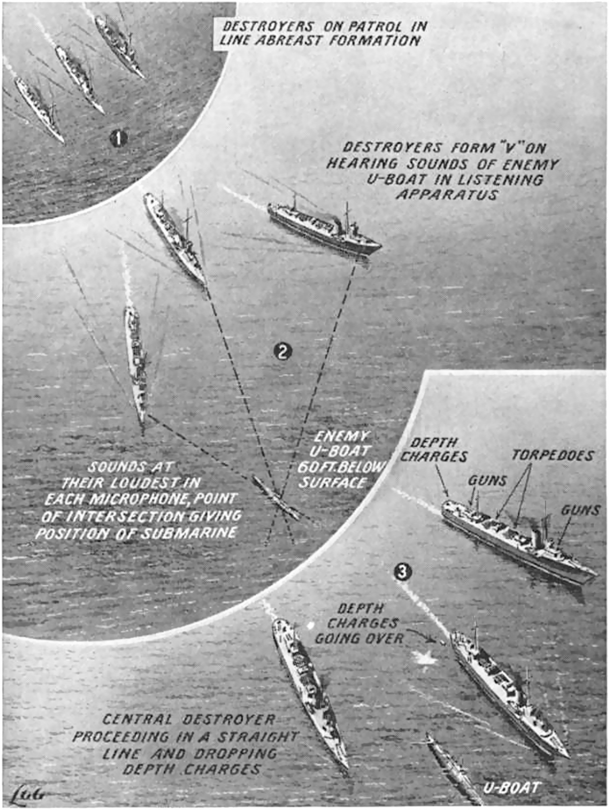
Fig. 14. *The depth charge is really a very simple mechanism, consisting of a container of high explosive set to explode at a given depth. (Right) Firing mortar and depth charge loaded.*


DEPTH CHARGE THROWN BY DESTROYER.
2
1
4
3
DESTROYER DROPPING CHARGES IN DIAMOND FORMATION. 1ST ASTERN 2ND 3RD PORT & STARBOARD. 4TH ASTERN..
FISHER

TACTICS OF DEPTH CHARGE ATTACK ON A SUBMARINE

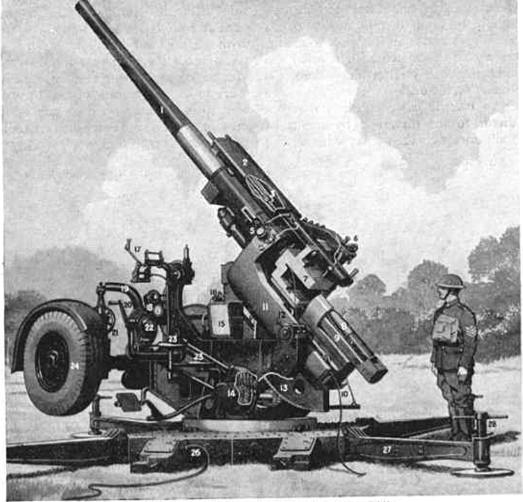
Fig. 15. *This impression of an individual destroyer's part in destroying a submarine should be compared with the illustration on page 297, showing three destroyers working together. Each destroyer drops its depth charges in groups of four, laid so that they form a diamond formation. The explosion of a depth charge may cripple a U-boat, without actual contact.*


DESTROYERS FITTED WITH HYDROPHONES ON BOWS AND STERN
SOUND WAVES FROM SUBMARINE'S MOTORS
MOVABLE DIAPHRAGM ATTACHED TO MICROPHONE
ENEMY U-BOAT


DESTROYERS ON PATROL IN LINE ABREAST FORMATION
①
DESTROYERS FORM "V" ON HEARING SOUNDS OF ENEMY U-BOAT IN LISTENING APPARATUS
②
SOUNDS AT THEIR LOUDEST IN EACH MICROPHONE, POINT OF INTERSECTION GIVING POSITION OF SUBMARINE
ENEMY U-BOAT 60 FT. BELOW SURFACE
DEPTH CHARGES
TORPEDOES
GUNS
GUNS
③
DEPTH CHARGES GOING OVER
CENTRAL DESTROYER PROCEEDING IN A STRAIGHT LINE AND DROPPING DEPTH CHARGES
U-BOAT

HOW DESTROYERS DEAL WITH THE U-BOAT MENACE

Fig. 16a. *The modern destroyer, properly employed, is just as fearsome a foe to the submarine as the latter is to any surface vessel. The destroyer "Sirocco," pride of the French Navy, sank three German submarines early in the war, proving that the underwater weapon is no longer the menace it once was. The above illustration shows how three destroyers (shown here closer together than they would actually be) can trap and destroy a U-boat.*



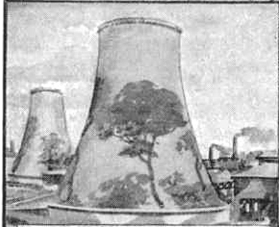
VICKERS 3.7-INCH ANTI-AIRCRAFT GUN

Fig. 13. *The shell and cartridge of this gun weighs about half a hundredweight, yet eight rounds per minute can be fired. 1, Barrel. 2, Recuperator. 3, Recuperator piston. 4, Recoil cylinder. 5, Oil gauge. 6, Breech pivot. 7, Breech block. 8, High-explosive shell. 9, Loading tray. 10, Cord for sliding loading tray into breech. 11, Cradle. 12, Trunnion. 13, Elevating arc and gears. 14, Gear case. 15, Screen for fuse setter. 16, Bearing dials. 17, Sights. 18, Elevating dials. 19, Wheel davits. 20, Elevating handles. 21, Wheel lowering hand wheel. 22, Drift indicator. 23, Seats. 24, Road wheel raised. 25, Turntable. 26, Cable from predictor. 27, Gun legs. 28, Screw adjusters.*

CAMOUFLAGE WITH NATURAL FOLIAGE

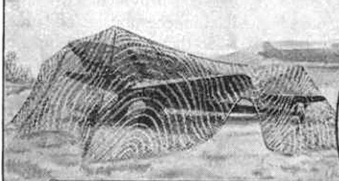
GRASS GROWN OVER STEEL LANDING GROUND OF AERODROME

AIRCRAFT INVISIBLE FROM ABOVE



STEAM TOWERS EFFECTIVELY DEALT WITH

NETTING OVER TANKS GARAGED IN AN ORCHARD



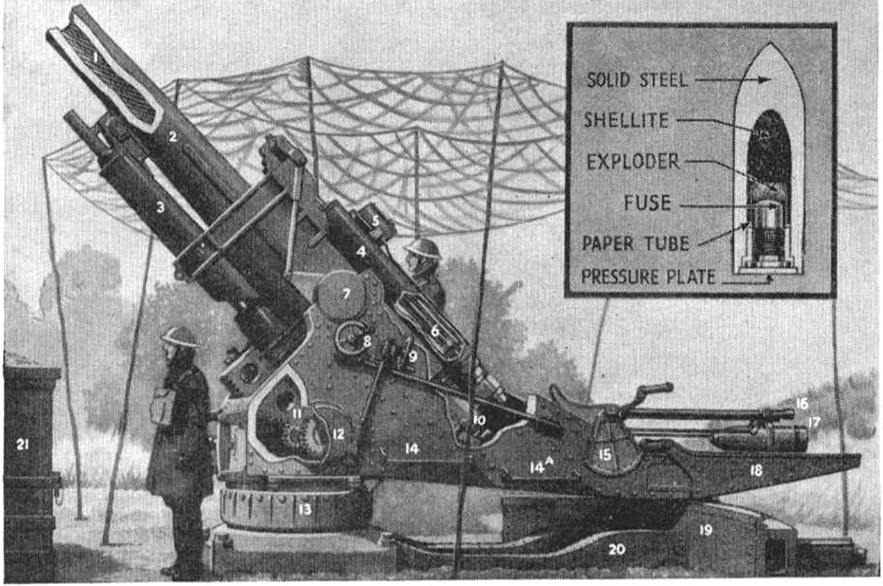
STRIPED NETTING OVER FIGHTER PLANES

WHITE OVERALLS

GUN CREW DRESSED IN WHITE

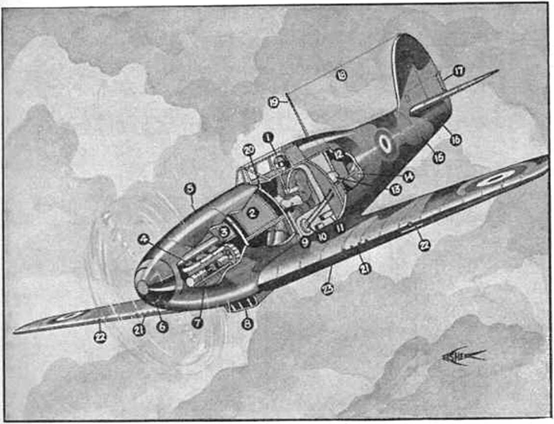
ANTI-TANK GUN HIDDEN BY CLOTH STRIPS ON NETTING

STRIPE PAINTED COVERS AND NETTING



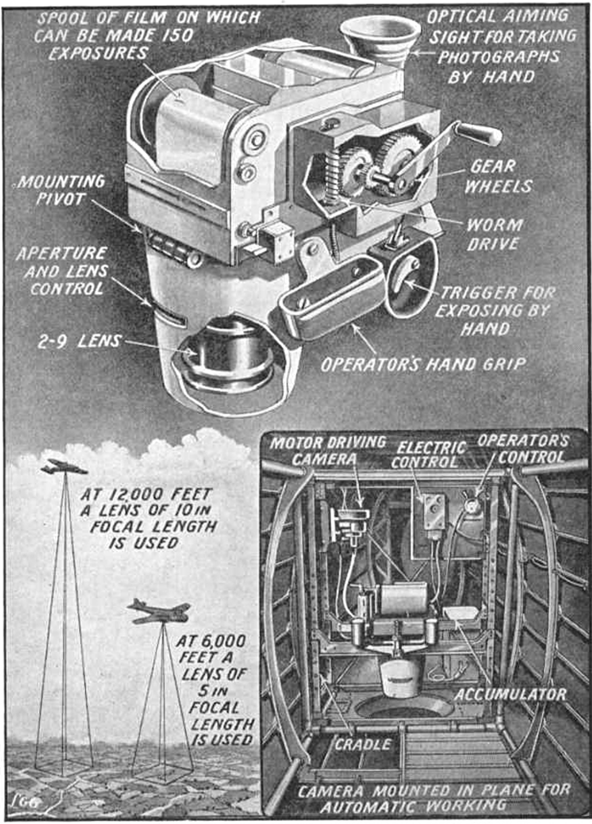
BRITISH 9.2-INCH HOWITZER AND ITS SHELL

Fig. 3. *The 9.2-inch howitzer has a crew of four men, and can throw its huge shell eight miles. 1, Barrel and interior rifling. 2, Recoil slide. 3, Recuperator. 4, Recoil cylinder. 5, Oil cylinder. 6, Recoil piston and rod. 7, Trunnion. 8, Traversing handle. 9, Elevating handle. 10, Breech. 11, Elevating arc and gears. 12, Gear case. 13, Foundation ring. 14, 14a, Platforms for gunners. 15, Shell loading hand gear. 16, Mechanical loading arms. 17, Shell ready for loading. 18, Shell platform. 19, Traversing platform. 20, Foundations. 21, Earth-filled box which helps to keep the gun steady. Inset are details of the shell.*



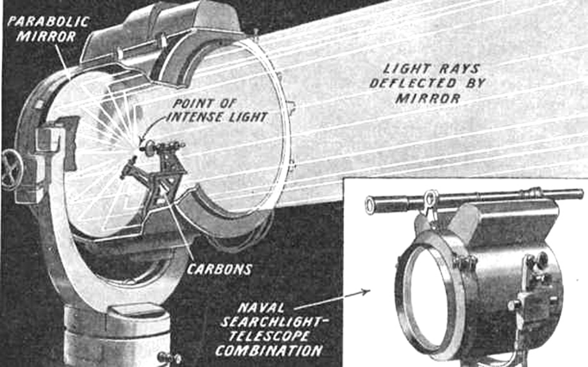
HAWKER "HURRICANE" SINGLE-SEATER FIGHTER

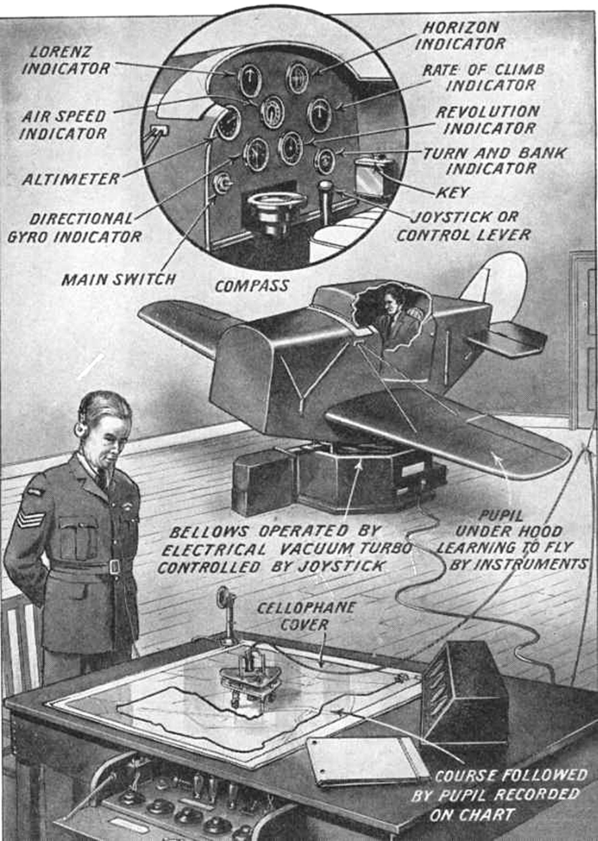
Fig. 2. *This fighter has a speed of over 335 m.p.h., and with the "Spitfire" is Britain's leading intercepter fighter. 1, Pilot. 2, Fuel tank. 3, Header tank. 4, Exhausts. 5, Front bead sights. 6, Spinners. 7, Rolls-Royce "Merlin II" 1,030-h.p. engine (liquid cooled). 8, Air intake. 9, Throttle controls. 10, Tail trimming tab control. 11, Fuse box. 12, Radio. 13, Oxygen cylinder. 14, Parachute flares. 15, Fabric covering. 16, Tail wheel retracted. 17, Rudder trimming tab. 18, Aerial. 19, Aerial mast. 20, Instrument panel. 21, Four Browning machine guns. 22, Landing light. 23, Undercarriage retracted.*

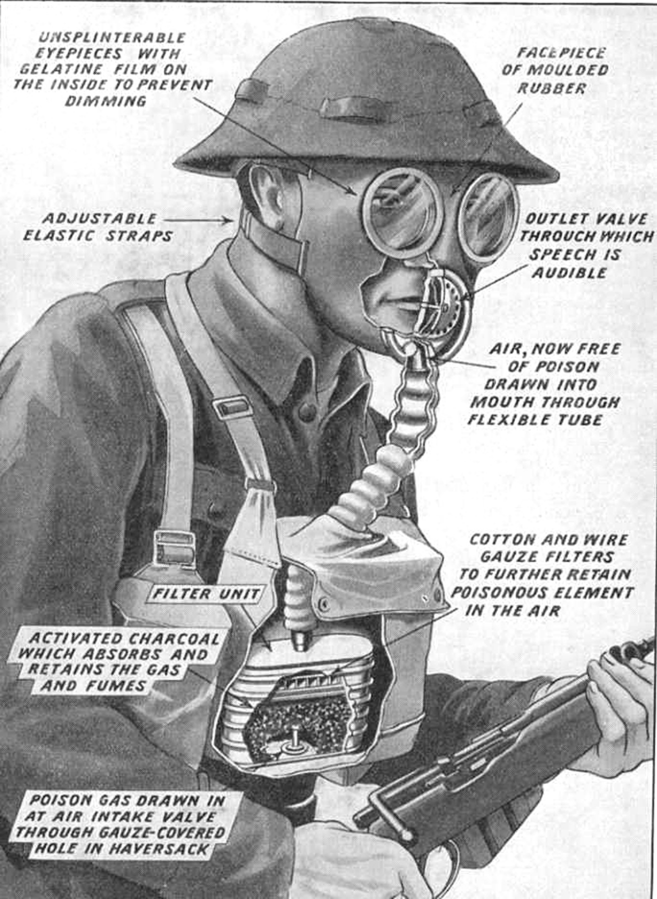

SPOOL OF FILM ON WHICH CAN BE MADE 150 EXPOSURES
OPTICAL AIMING SIGHT FOR TAKING PHOTOGRAPHS BY HAND
MOUNTING PIVOT
GEAR WHEELS
WORM DRIVE
APERTURE AND LENS CONTROL
TRIGGER FOR EXPOSING BY HAND
2-9 LENS
OPERATOR'S HAND GRIP
MOTOR DRIVING CAMERA
ELECTRIC CONTROL
OPERATOR'S CONTROL
AT 12,000 FEET A LENS OF 10 IN FOCAL LENGTH IS USED
AT 6,000 FEET A LENS OF 5 IN FOCAL LENGTH IS USED
ACCUMULATOR
CRADLE
CAMERA MOUNTED IN PLANE FOR AUTOMATIC WORKING

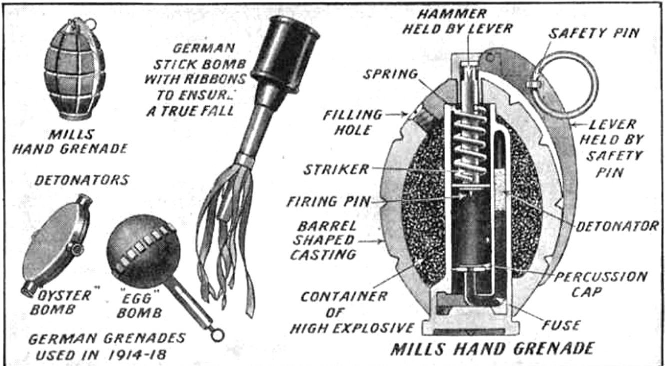
AERIAL CAMERAS—HOW THEY ARE FITTED AND USED

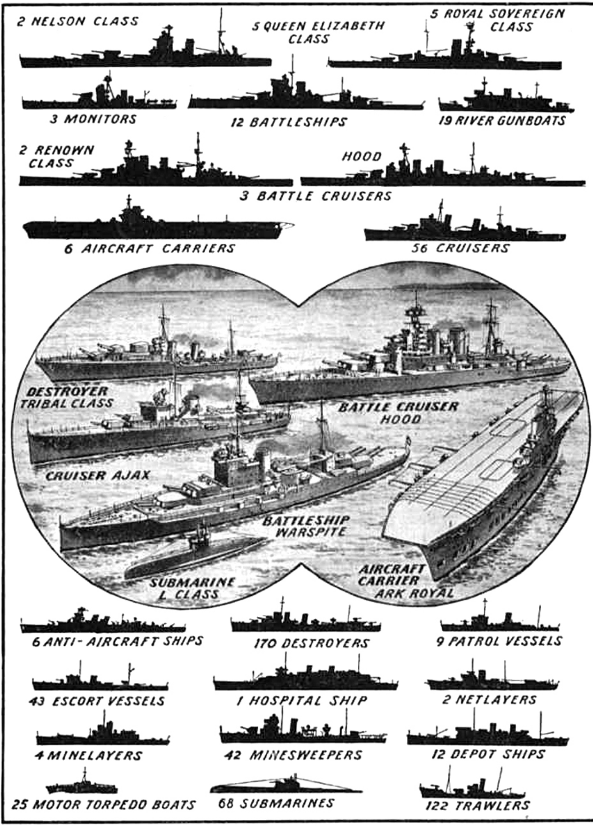
Fig. 6. (*Top*) *Details of a hand camera.* (*Below right*) *Automatic camera in position.* (*Below left*) *All photographs must be of uniform size, and to ensure this uniformity the focal length of the lens used is varied with the height of the plane.*

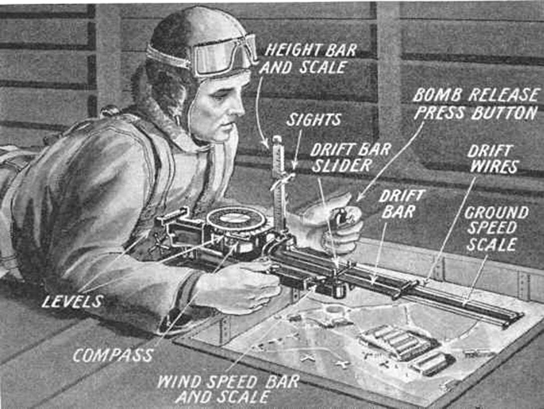

PARABOLIC MIRROR
POINT OF INTENSE LIGHT
LIGHT RAYS DEFLECTED BY MIRROR
CARBONS
NAVAL SEARCHLIGHT-TELESCOPE COMBINATION

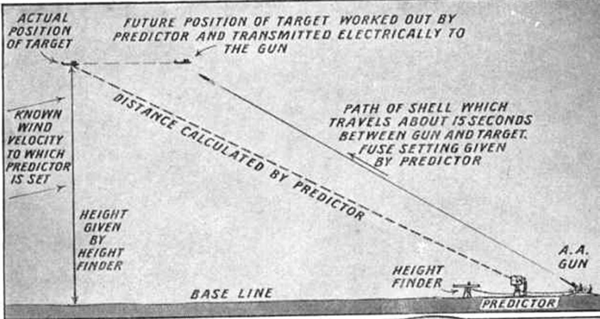

LORENZ INDICATOR
AIR SPEED INDICATOR
ALTIMETER
DIRECTIONAL GYRO INDICATOR
MAIN SWITCH
COMPASS
HORIZON INDICATOR
RATE OF CLIMB INDICATOR
REVOLUTION INDICATOR
TURN AND BANK INDICATOR
KEY
JOYSTICK OR CONTROL LEVER
BELLOWS OPERATED BY ELECTRICAL VACUUM TURBO CONTROLLED BY JOYSTICK
PUPIL UNDER HOOD LEARNING TO FLY BY INSTRUMENTS
CELLOPHANE COVER
COURSE FOLLOWED BY PUPIL RECORDED ON CHART

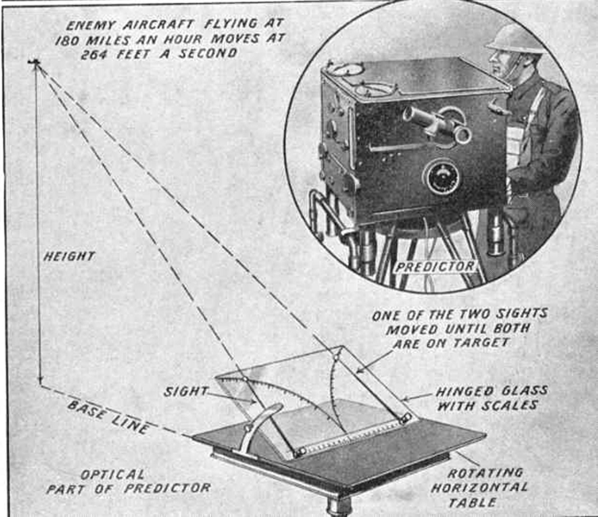

UNSPLINTERABLE EYEPIECES WITH GELATINE FILM ON THE INSIDE TO PREVENT DIMMING
FACEPIECE OF MOULDED RUBBER
ADJUSTABLE ELASTIC STRAPS
OUTLET VALVE THROUGH WHICH SPEECH IS AUDIBLE
AIR, NOW FREE OF POISON DRAWN INTO MOUTH THROUGH FLEXIBLE TUBE
COTTON AND WIRE GAUZE FILTERS TO FURTHER RETAIN POISONOUS ELEMENT IN THE AIR
FILTER UNIT
ACTIVATED CHARCOAL WHICH ABSORBS AND RETAINS THE GAS AND FUMES
POISON GAS DRAWN IN AT AIR INTAKE VALVE THROUGH GAUZE-COVERED HOLE IN HAVERSACK

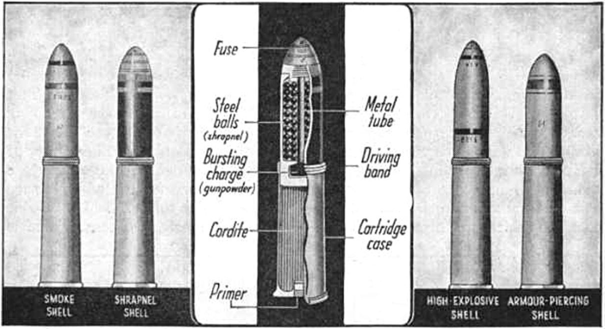

MILLS
HAND GRENADE
GERMAN
STICK BOMB
WITH RIBBONS
TO ENSURE
A TRUE FALL
DETONATORS
"OYSTER"
BOMB
"EGG"
BOMB
GERMAN GRENADES
USED IN 1914-18
HAMMER
HELD BY LEVER
SAFETY PIN
SPRING
FILLING
HOLE
LEVER
HELD BY
SAFETY
PIN
STRIKER
FIRING PIN
DETONATOR
BARREL
SHAPED
CASTING
PERCUSSION
CAP
CONTAINER
OF
HIGH EXPLOSIVE
FUSE
MILLS HAND GRENADE


2 NELSON CLASS
5 QUEEN ELIZABETH CLASS
5 ROYAL SOVEREIGN CLASS
3 MONITORS
12 BATTLESHIPS
19 RIVER GUNBOATS
2 RENOWN CLASS
HOOD
3 BATTLE CRUISERS
6 AIRCRAFT CARRIERS
56 CRUISERS
DESTROYER TRIBAL CLASS
BATTLE CRUISER HOOD
CRUISER AJAX
BATTLESHIP WARSPITE
SUBMARINE L CLASS
AIRCRAFT CARRIER ARK ROYAL
6 ANTI-AIRCRAFT SHIPS
170 DESTROYERS
9 PATROL VESSELS
43 ESCORT VESSELS
1 HOSPITAL SHIP
2 NETLAYERS
4 MINELAYERS
42 MINESWEEPERS
12 DEPOT SHIPS
25 MOTOR TORPEDO BOATS
68 SUBMARINES
122 TRAWLERS


HEIGHT BAR AND SCALE
BOMB RELEASE PRESS BUTTON
SIGHTS
DRIFT BAR SLIDER
DRIFT WIRES
DRIFT BAR
GROUND SPEED SCALE
LEVELS
COMPASS
WIND SPEED BAR AND SCALE

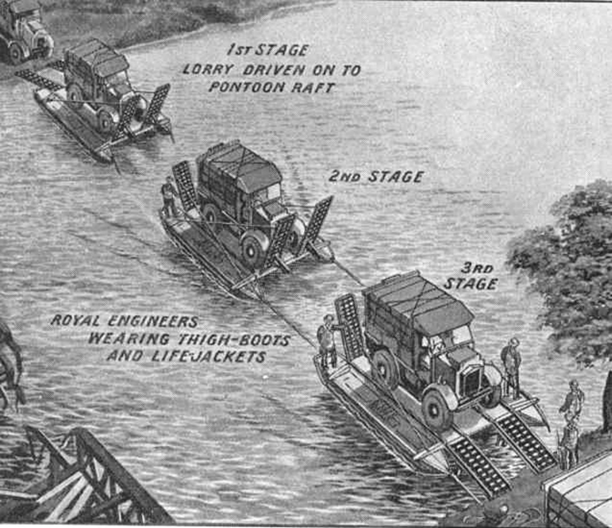

ACTUAL POSITION OF TARGET
FUTURE POSITION OF TARGET WORKED OUT BY PREDICTOR AND TRANSMITTED ELECTRICALLY TO THE GUN
KNOWN WIND VELOCITY TO WHICH PREDICTOR IS SET
DISTANCE CALCULATED BY PREDICTOR
PATH OF SHELL WHICH TRAVELS ABOUT 15 SECONDS BETWEEN GUN AND TARGET. FUSE SETTING GIVEN BY PREDICTOR
HEIGHT GIVEN BY HEIGHT FINDER
A.A. GUN
HEIGHT FINDER
BASE LINE
PREDICTOR

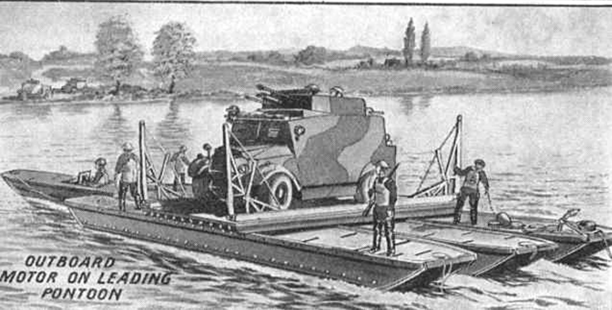

ENEMY AIRCRAFT FLYING AT 180 MILES AN HOUR MOVES AT 264 FEET A SECOND
PREDICTOR
HEIGHT
ONE OF THE TWO SIGHTS MOVED UNTIL BOTH ARE ON TARGET
SIGHT
HINGED GLASS WITH SCALES
BASE LINE
OPTICAL PART OF PREDICTOR
ROTATING HORIZONTAL TABLE

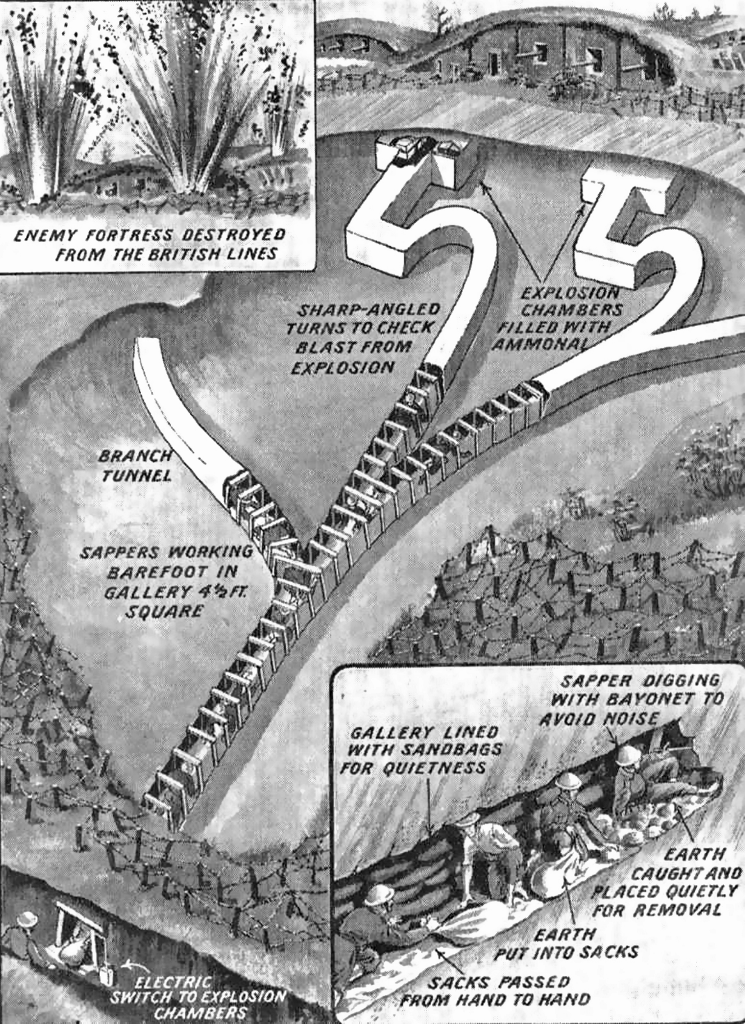


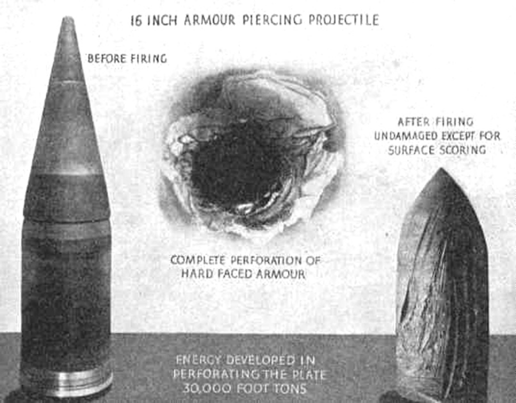
FOUR TYPES OF MODERN SHELL

Fig. 2. *Modern artillery uses a diversity of weapons firing many different projectiles. Smoke shells are used to cover advances or retreats. Shrapnel shells, exploding in mid-air, shower death on the enemy from above. High-explosive shells shatter buildings and destroy enemy batteries. Armour-piercing shells are used against tanks.*

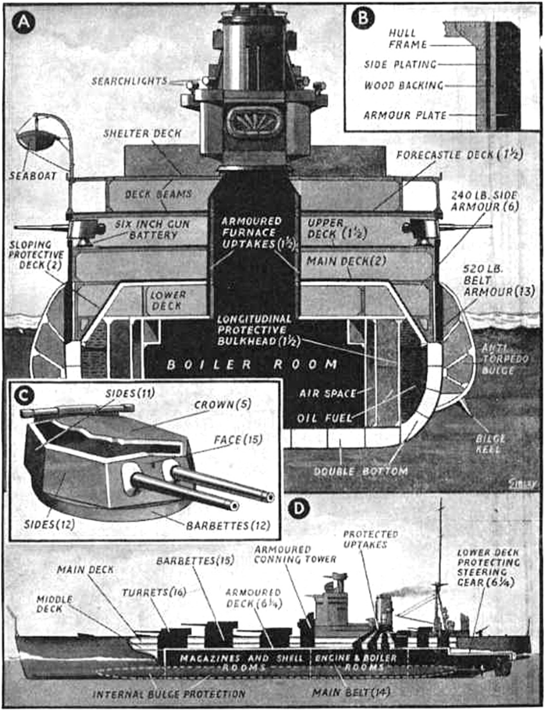

1ST STAGE LORRY DRIVEN ON TO PONTOON RAFT
2ND STAGE
3RD STAGE
ROYAL ENGINEERS WEARING THIGH-BOOTS AND LIFE-JACKETS


OUTBOARD MOTOR ON LEADING PONTOON


ENEMY FORTRESS DESTROYED FROM THE BRITISH LINES
SHARP-ANGLED TURNS TO CHECK BLAST FROM EXPLOSION
EXPLOSION CHAMBERS FILLED WITH AMMONAL
BRANCH TUNNEL
SAPPERS WORKING BAREFOOT IN GALLERY 4½ FT. SQUARE
SAPPER DIGGING WITH BAYONET TO AVOID NOISE
GALLERY LINED WITH SANDBAGS FOR QUIETNESS
EARTH CAUGHT AND PLACED QUIETLY FOR REMOVAL
EARTH PUT INTO SACKS
SACKS PASSED FROM HAND TO HAND
ELECTRIC SWITCH TO EXPLOSION CHAMBERS

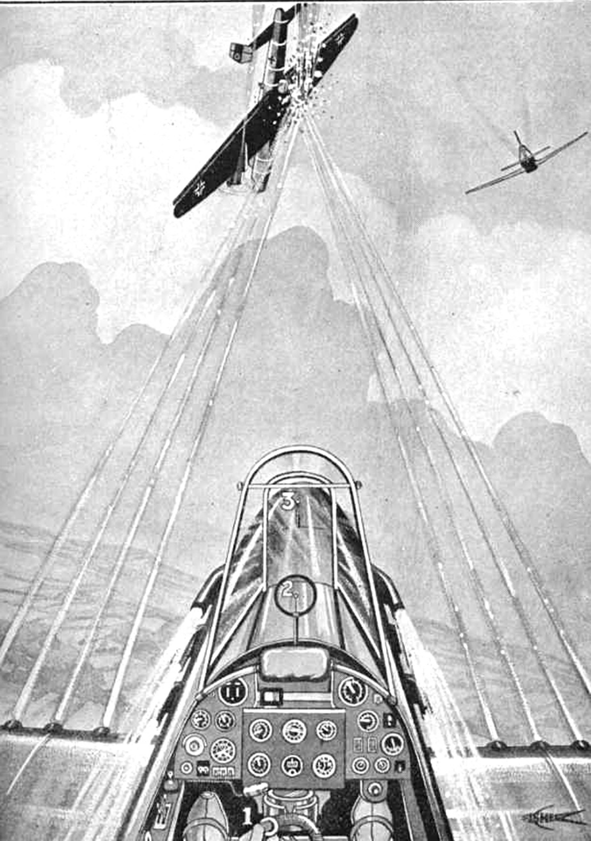


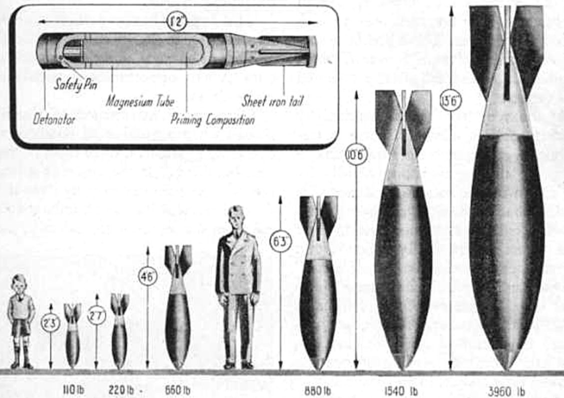
16 INCH ARMOUR PIERCING PROJECTILE

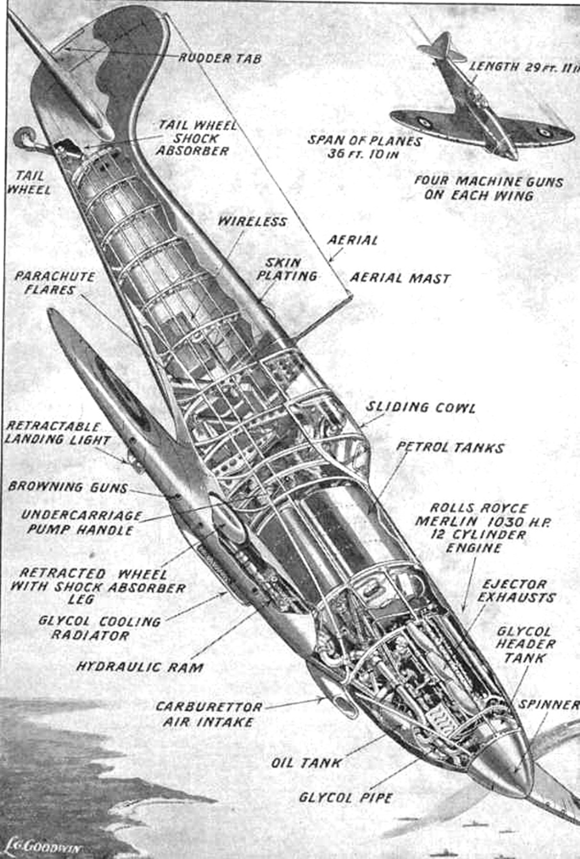


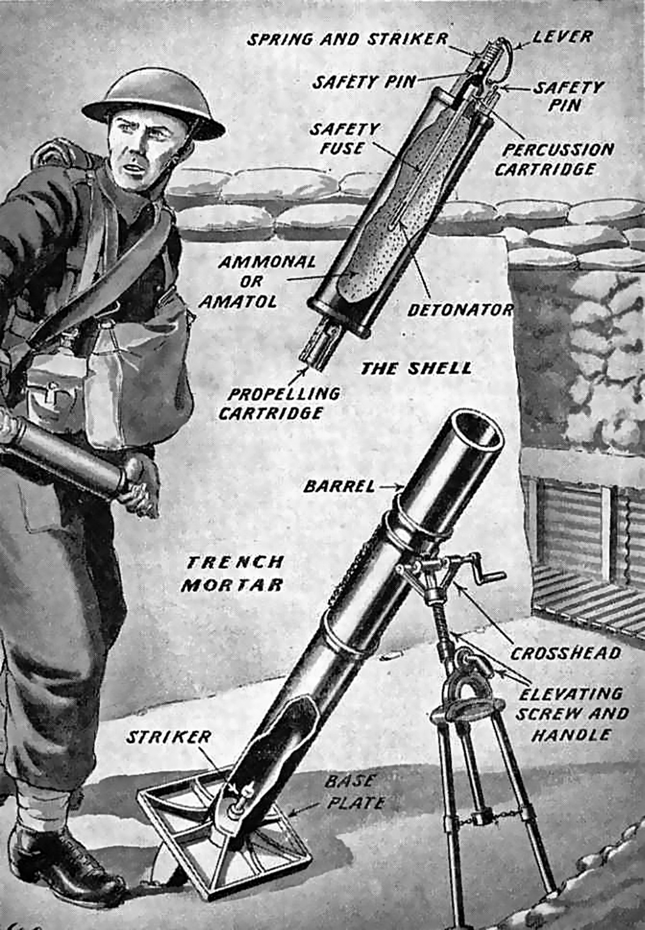
ARMOUR PROTECTION OF A BATTLESHIP

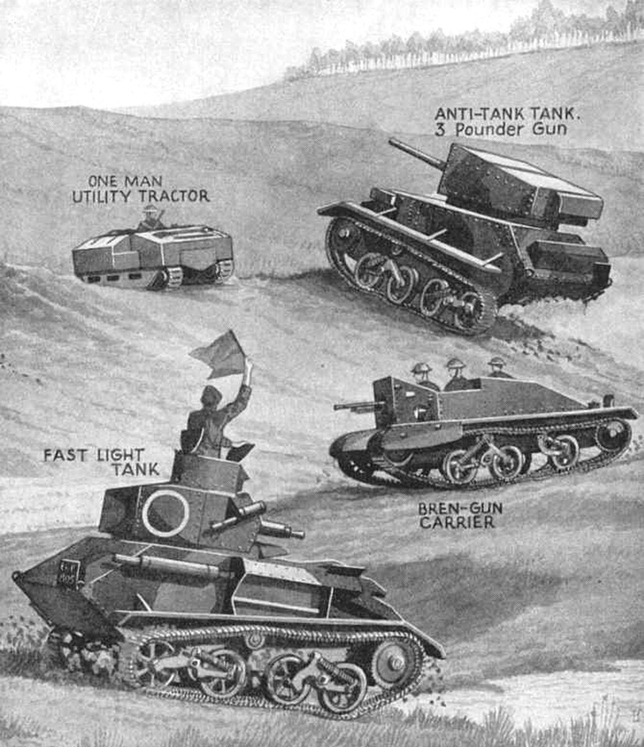
Fig. 9. *Detail of the armour plating carried by a modern battleship. The figures in brackets denote the thickness in inches of the armour plate. Note the anti-torpedo bulge which takes the force of the explosion in the event of the ship being struck. In most modern ships this bulge is internal, and does not interfere with the ship's normal lines.* (A) *Cross section amidships of battleship of the "Royal Sovereign" class.* (B) *Armour plate mounting.* (C) *Armoured gun turret of H.M.S. "Hood."* (D) *Armour of H.M.S. "Nelson."*

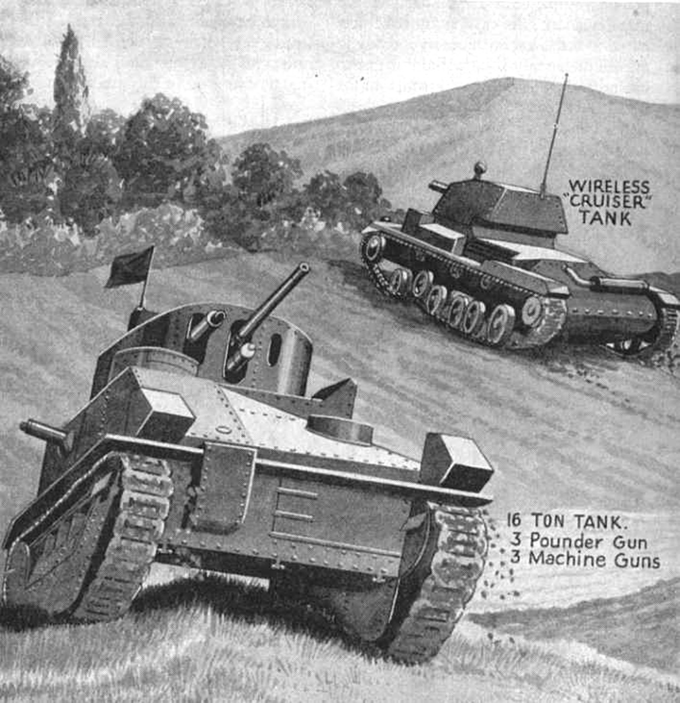

3
2
1

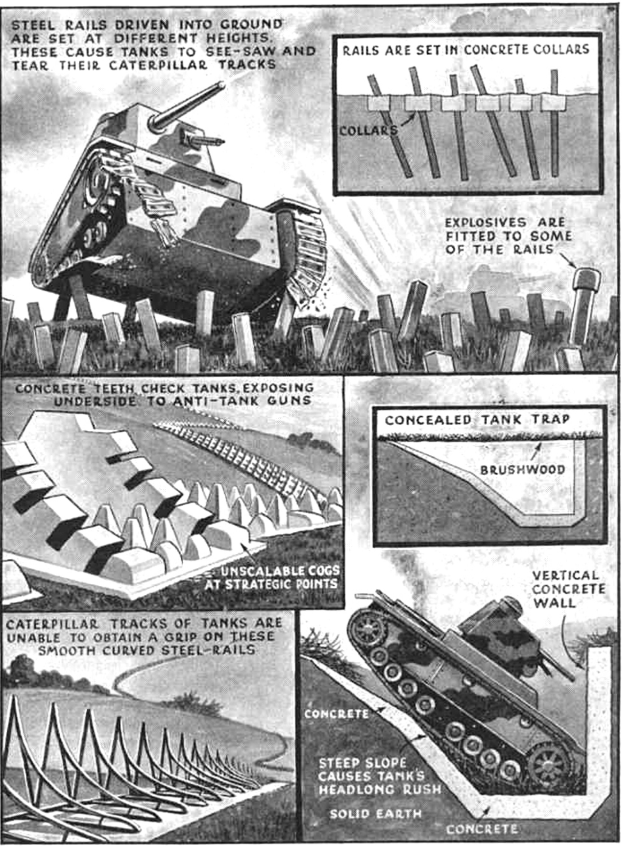

1'2"
Safety Pin
Magnesium Tube
Sheet iron tail
Detonator
Priming Composition
2'3"
2'7"
4'6"
6'3"
10'6"
13'6"
110 lb
220 lb -
660 lb
880 lb
1540 lb
3960 lb


RUDDER TAB
LENGTH 29 FT. 11 I
TAIL WHEEL SHOCK ABSORBER
SPAN OF PLANES 36 FT. 10 IN
TAIL WHEEL
FOUR MACHINE GUNS ON EACH WING
WIRELESS
AERIAL
SKIN PLATING
PARACHUTE FLARES
AERIAL MAST
SLIDING COWL
RETRACTABLE LANDING LIGHT
PETROL TANKS
BROWNING GUNS
UNDERCARRIAGE PUMP HANDLE
ROLLS ROYCE MERLIN 1030 H.P. 12 CYLINDER ENGINE
RETRACTED WHEEL WITH SHOCK ABSORBER LEG
EJECTOR EXHAUSTS
GLYCOL COOLING RADIATOR
GLYCOL HEADER TANK
HYDRAULIC RAM
CARBURETTOR AIR INTAKE
SPINNER
OIL TANK
GLYCOL PIPE
L.G. GOODWIN


SPRING AND STRIKER
LEVER
SAFETY PIN
SAFETY PIN
SAFETY FUSE
PERCUSSION CARTRIDGE
AMMONAL OR AMATOL
DETONATOR
THE SHELL
PROPELLING CARTRIDGE
BARREL
TRENCH MORTAR
CROSSHEAD
ELEVATING SCREW AND HANDLE
STRIKER
BASE PLATE

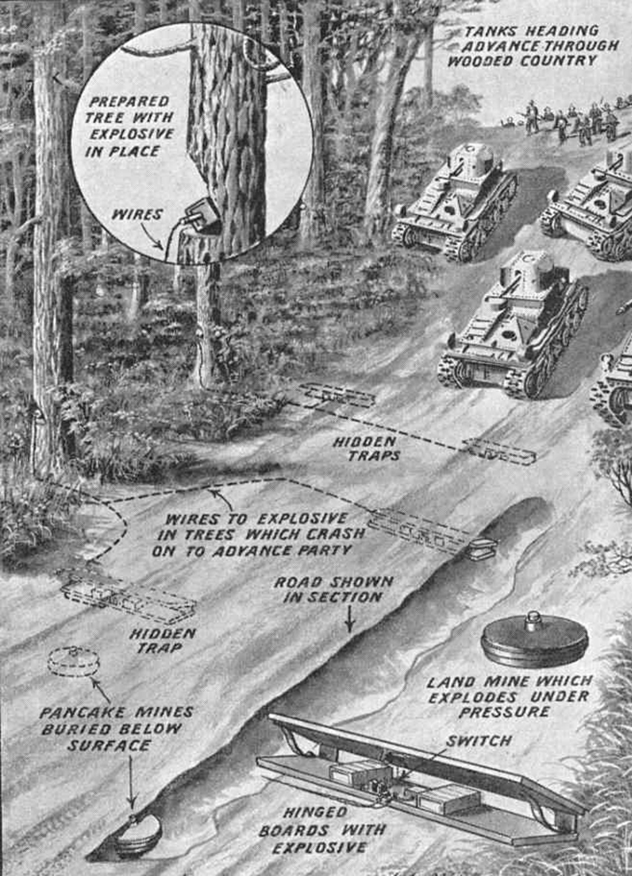

ANTI-TANK TANK.
3 Pounder Gun
ONE MAN
UTILITY TRACTOR
FAST LIGHT
TANK
BREN-GUN
CARRIER

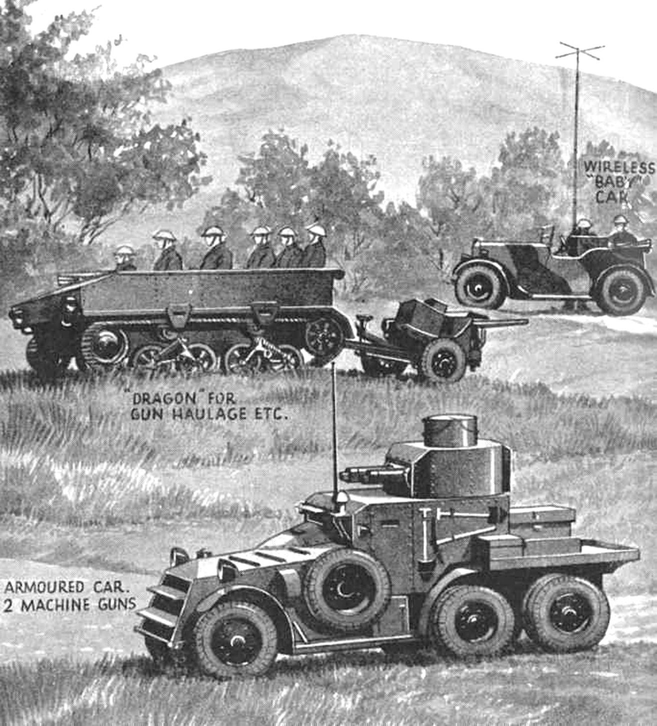

WIRELESS "CRUISER" TANK
16 TON TANK.
3 Pounder Gun
3 Machine Guns

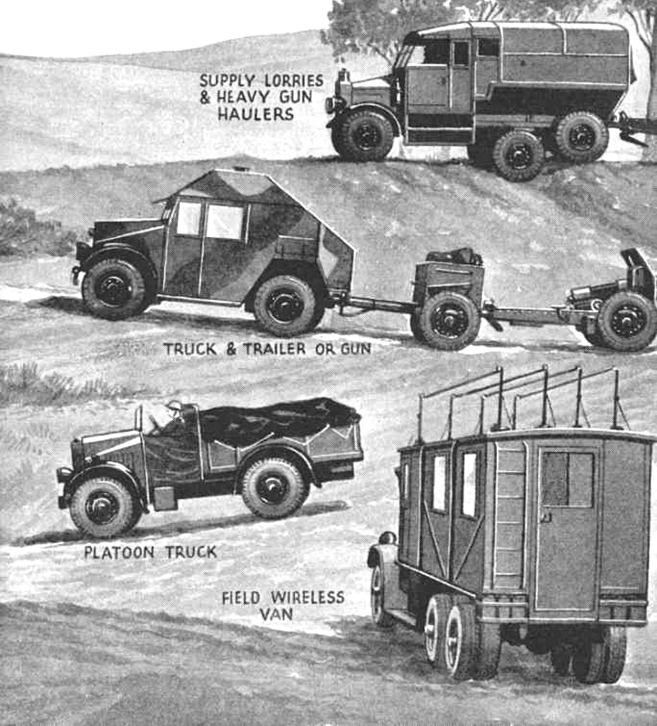

STEEL RAILS DRIVEN INTO GROUND ARE SET AT DIFFERENT HEIGHTS. THESE CAUSE TANKS TO SEE-SAW AND TEAR THEIR CATERPILLAR TRACKS
RAILS ARE SET IN CONCRETE COLLARS
COLLARS
EXPLOSIVES ARE FITTED TO SOME OF THE RAILS
CONCRETE TEETH CHECK TANKS, EXPOSING UNDERSIDE TO ANTI-TANK GUNS
UNSCALABLE COGS AT STRATEGIC POINTS
CONCEALED TANK TRAP
BRUSHWOOD
VERTICAL CONCRETE WALL
CATERPILLAR TRACKS OF TANKS ARE UNABLE TO OBTAIN A GRIP ON THESE SMOOTH CURVED STEEL-RAILS
CONCRETE
STEEP SLOPE CAUSES TANK'S HEADLONG RUSH
SOLID EARTH
CONCRETE

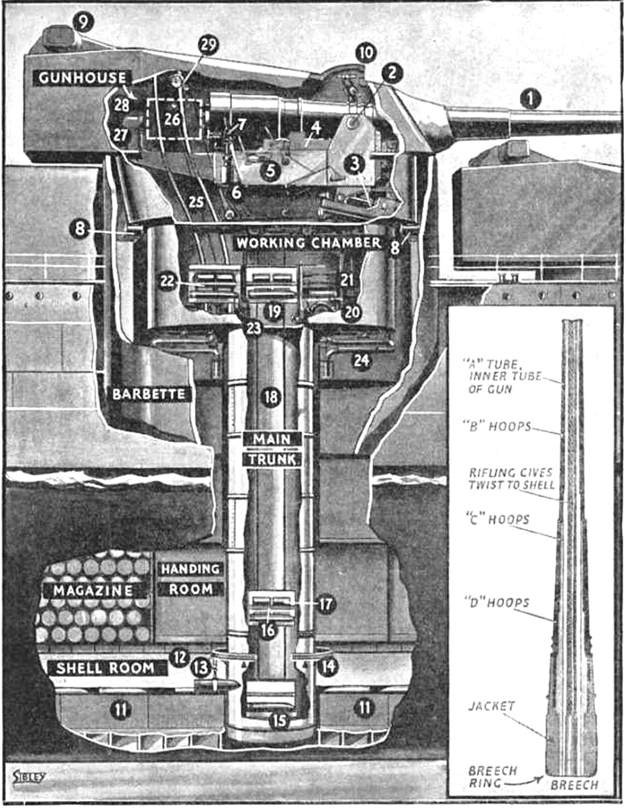
MAKING IT DIFFICULT FOR THE TANKS

Fig. 8. *Assault upon modern fortifications has been rendered so hazardous that only by the use of tanks is it at all practicable. To counter attacks various obstacles have been devised, the most usual being numbers of steel posts set in reinforced concrete, popularly known as "asparagus beds," designed to tear the tractors off the vehicle, and tank pits covered by brushwood. The above illustrations of these obstructions are self-explanatory.*


TANKS HEADING ADVANCE THROUGH WOODED COUNTRY
PREPARED TREE WITH EXPLOSIVE IN PLACE
WIRES
HIDDEN TRAPS
WIRES TO EXPLOSIVE IN TREES WHICH CRASH ON TO ADVANCE PARTY
ROAD SHOWN IN SECTION
HIDDEN TRAP
LAND MINE WHICH EXPLODES UNDER PRESSURE
PANCAKE MINES BURIED BELOW SURFACE
SWITCH
HINGED BOARDS WITH EXPLOSIVE

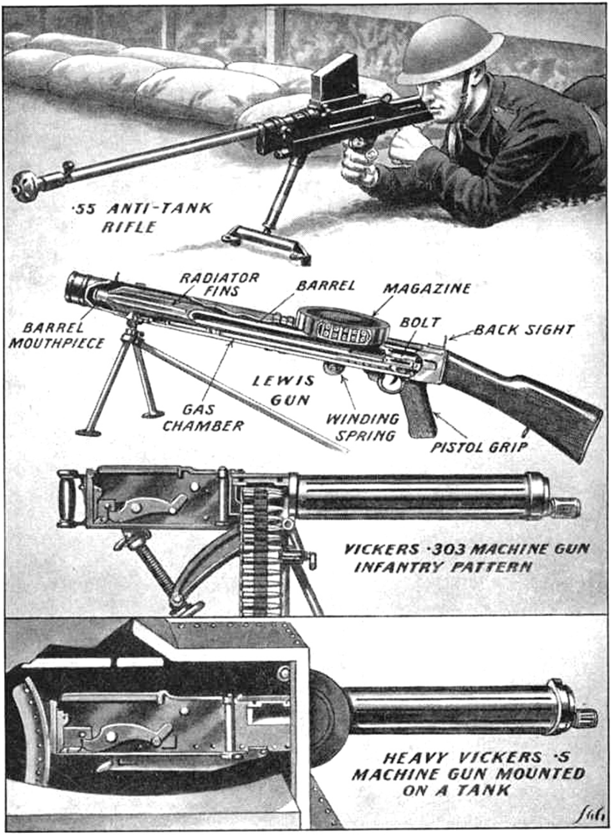

WIRELESS "BABY" CAR
"DRAGON" FOR GUN HAULAGE ETC.
ARMOURED CAR. 2 MACHINE GUNS


SUPPLY LORRIES
& HEAVY GUN
HAULERS
TRUCK & TRAILER OR GUN
PLATOON TRUCK
FIELD WIRELESS
VAN



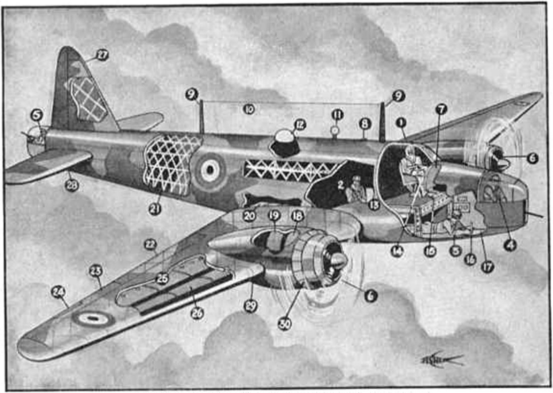
MECHANICS OF A 15-INCH GUN TURRET

Fig. 20. *1, Two 15-inch guns. 2, Trunnion. 3, Elevating gear. 4, Cradle. 5, Slide. 6 and 7, Breech opening motor and gear. 8, Rollers upon which turret revolves. 9, Range finder. 10, Centre sighting hood. 11, Shell bins. 12, Overhead tracking for moving shells. 13, Shell lifting and lowering gear. 14, Circular trackway. 15, Shell in tray. 16, Cordite trays. 17, Cordite charges. 18, Cables. 19, Ammunition cage. 20, Cage hoist. 21, Cordite and shell rammers for loading. 22, Gun cage. 23, Gun-loading cage hoist. 24, Hydraulic power pipes. 25, Cage guide rails. 26, Cage in loading position. 27, Rammer. 28, Controls. 29, Cage hoisting gear. (Inset) Section through gun showing tubes and hoops.*



AUTOMATIC WEAPONS OF MODERN INFANTRY

Fig. 10. *The .55 anti-tank rifle (above) is 5 feet 4 inches long, and this extreme length gives it a deadly accuracy. It fires a bullet that can pierce armour at a range of 500 yards. The Lewis gun (centre) is operated by gas and its magazine holds forty-seven rounds. Heavier machine guns are the Vickers .303 used by infantry, and the Vickers .5 used by tanks.*



VICKERS "WELLINGTON" MEDIUM BOMBER

Fig. 11. *This machine, a medium bomber of great range, is built on the geodetic principle. 1, Pilot. 2, Wireless operator. 3, Bomb aimers. 4, Forward guns. 5, Rear gunners. 6, 980-h.p. Bristol "Pegasus" engine. 7, Instrument panel. 8, Navigator's sight. 9, Aerial mast. 10, Aerial. 11, Directional loop. 12, Observer's hatch. 13, Radio. 14, Control lever. 15, Rudder bar. 16, Course-setting bomb sight. 17, Bomb aimer's window. 18, Oil tank. 19, Gravity fuel tank. 20, Bomb doors. 21, Geodetic structure. 22, Flap. 23, Aileron. 24, Aileron trim tab. 25, Aft fuel tanks. 26, Front fuel tanks. 27, Rudder mass-balance. 28, Tail wheel retracted. 29, Undercarriage retracted. 30, Cooling gills.*